

THE IRON AGE

THURSDAY, MARCH 12, 1891.

The Graydon Dynamite Gun.

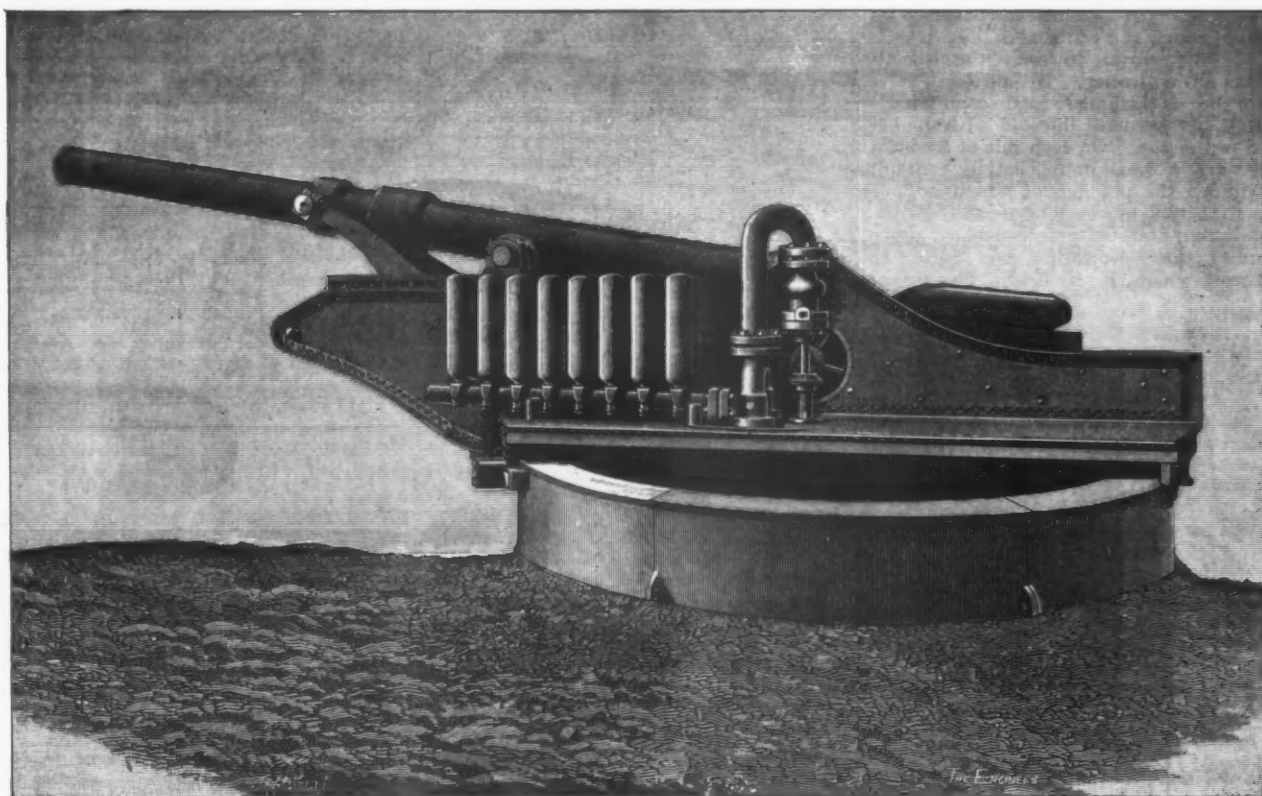
The Graydon gun, designed to throw a shell loaded with dynamite, has been recently tested in England. The accompanying illustrations and description we take from the *Engineer*:

The invention of Lieut. James Graydon, late United States Navy, is as follows: His object is to inclose dynamite in a steel shell in such a way as to protect it from premature explosion or shock of discharge, and from explosion on impact before the desired penetration is achieved. To this end he lines a steel shell, shown in Fig. 5, with asbestos, A A A, to prevent the conduction of heat from the shell to the charge B, B, either in the gun or on im-

and had shot marks and some cracks in it. It was set up without backing, and was not in any way supported or braced. The gun employed was a 7-inch Ames wrought iron muzzle loading rifle piece. The projectiles were steel shells of the service pattern, but provided with a large opening in the base to enable the shell to be charged on Graydon's system. The total weight of filled shell as fired was 122 pounds; the weight of powder firing charge was 23 pounds; the bursting charge was 2.3 pounds of dynamite No. 2.

The claims of Lieutenant Graydon for his shell are enumerated as follows by the Government report: 1. That the action is delayed until the penetration necessary for full effect is obtained. 2. Shells charged

first shot and exploded. It increased the first indentation by about 2 inches, and continued the crack made by the first shot and several others. The third round was fired fused. The shell struck in an old indentation 3 inches deep, 1 foot below the horizontal joint, and 3 feet from the left edge of the target and exploded. It completely penetrated the front plate and bulged and cracked the rear one. It made considerable cracking and separation of the plates. One piece was detached from the left of the target about 3 feet square, the report says, weighing about 2700 pounds—but marked as weighing 4000 pounds in the sketch—see Fig. 3. This was thrown 18 feet to the left. Four rounds were then fired on December



THE GRAYDON DYNAMITE PNEUMATIC GUN.

pact. To render the dynamite safe, and to prevent the nitro-glycerine from escaping and collecting in any one part of the mass, he makes up the dynamite in small cubes of $\frac{1}{4}$ inch wide, or in cylinders or spheres, which he incloses in paper saturated in paraffin, so as to seal them up hermetically. These are placed inside the asbestos-lined shell, being grouped in sections by divisions of thin metal paper or wood in larger shells. A wad is used at the base of the shell, to diminish the shock of discharge. The arrangement for slow action to insure penetration before explosion is to place the contact piece, or striker C, with a spiral spring, D, in front of it, which must be set up before the striker is fired by detonation.

The American official report of a trial of this shell, in the summer of 1887, may be summarized as follows: The target consisted of a portion of a turret of 14-inch wall, made up of two thicknesses of 7-inch plates, laid so as to break joint and roofed over with 3-inch plating; the whole was bolted together with $1\frac{1}{4}$ -inch bolts. This had been attacked by guns before,

with dynamite on this system can be safely fired with all guns. 3. Safety in handling and store is secured. 4. No special construction of shell is necessary so long as access can be obtained to the interior. 5. The shell will only break up by the action of the fuse on impact, so that the full range can be secured. 6. The compound will not explode if struck or penetrated by small arm bullets.

For the first round no fuse was used; the projectile struck the left-hand section of the target 2 feet above the horizontal joint and $2\frac{1}{4}$ feet to the left of the embrasure, as shown in the drawings, Figs. 2 and 3, which show the turret after three rounds, as sketched by Lieutenant Graydon. The shell entered 2 inches to 3 inches into the iron and exploded with great violence. The shell apparently had not struck fairly point first. The cover was lifted from the turret and toppled backwards. Seven roof bolts were broken and some cracks made.

The second round was fired with a fused shell; it struck the turret in an old indentation, partly overlapping that of the

2, of which the first one—round 4—fired at a wooden target 1 mile distant, burst prematurely at from 300 to 400 yards from the gun. Round 5, similarly fired, burst at or beyond the target. Round 6 was fired to sea at $8^{\circ} 30'$ elevation; it did not burst on striking the water. Round 7 was fired to sea at $13^{\circ} 30'$ elevation. The shell burst prematurely at about 1000 yards from the gun.

The New Dynamite Gun.

Since that date Lieutenant Graydon has not been idle. His shells were first fired with gunpowder, but he has now produced a pneumatic gun, which we here illustrate. This gun has been made by Taunton, Delmard, Lane & Co. of Birmingham. The gun is to be discharged by the expansion of condensed air, at a pressure of 5000 pounds per square inch. The shell is fitted with a telescopic tail, which enables Lieutenant Graydon to shorten his shell by one-half, and to reduce proportionately the length of the impulse tube or gun proper. The contract with Messrs. Taunton & Co. is for a

15-inch torpedo projector which will throw a charge of 600 pounds of dynamite a distance of 3 miles, but it is expected that this contract will be followed by orders for still larger weapons.

The barrel or pneumatic tube of the gun is of Whitworth forged steel, and weighs about 11 tons. It is supported at the breech end on fixed trunnions 15 inch diameter, which are bored for the passage of compressed air. Towards the muzzle it is carried on movable trunnions engaged with two forged steel arms or levers. These levers have sliding fulcrums and are actuated by a hydraulic plunger for the purpose of elevating or depressing the gun. The breech is closed by means of a steel screw-block with interrupted screw threads, as in heavy service ordnance. The peculiar feature of this particular Graydon gun is that it can be loaded at any degree of elevation within its working range. Pivoted to the breech trunnions there is a loading slide or tray for the reception of the projectile or torpedo, the weight of which is about 1 ton. This slide, at all times when the barrel is elevated above the horizontal line, rises by hydraulic pressure to receive the projectile from a tram-trolley. By opening a valve, the slide is then made to descend with its load, and becomes lineable with the barrel of the gun. On each side of the barrel is fixed a small double-acting hydraulic cylinder, the plungers of which not only control the movement of the loading slide, but also, by their continued action, draw the projectile up into the barrel, where it is held. The breech-

tions may be discharged, according to the range desired or the weight of the projectile. The discharging valves are a peculiar arrangement of the piston type, and are packed on the hydraulic system. All valves and pipes, where not forged, are of Whitworth cast steel. The carriage on which the barrel is mounted is constructed of heavy steel plates, with massive trunnion bearings of cast iron, secured to it by means of numerous turned bolts. The carriage is supported on the roller

at each stage. The first, which draws the air from the atmosphere, is 12 inches in diameter, and the last, which delivers it to the reservoirs, is 2½ inches. After each operation the air is cooled by a tubular coil surrounded with water. The construction of the pneumatic gun has been carried out by Mr. Lane, engineer to the company, under the supervision of the inventor, Lieut. J. W. Graydon, of the United States Navy, who has been residing in Birmingham with that object.

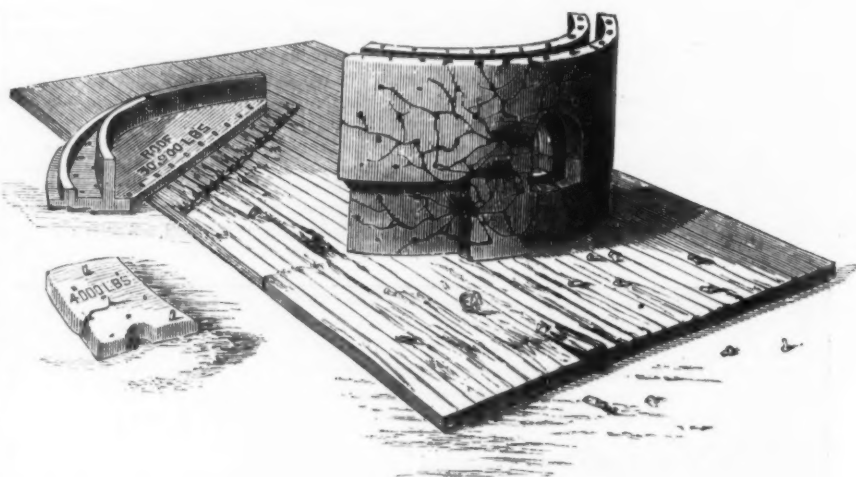


Fig. 2—Front View of Target.

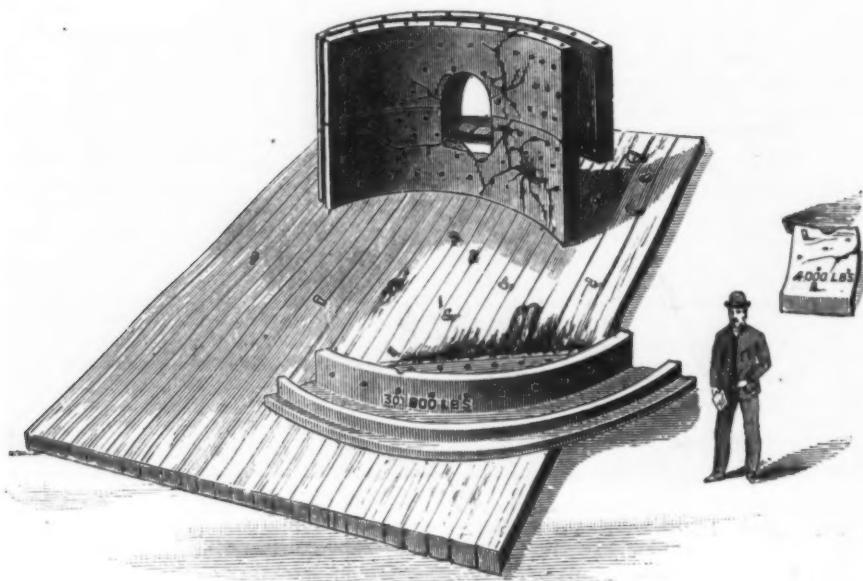


Fig. 3.—Back View of Target.



Fig. 4.—Appearance of Point of Shell After Explosion.

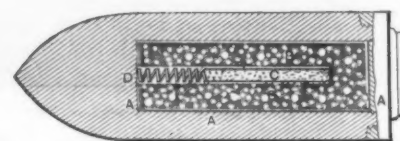


Fig. 5.—The Dynamite Shell.

THE GRAYDON DYNAMITE GUN.

closing block, suspended above the trunnions by counter weights, then descends, and is also drawn into the breech by the crossheads of the hydraulic plungers, and locked. The gun is now ready for discharge. The compressed-air reservoirs, a complement of which numbers 32, are 4 feet long and 10 inches in diameter, are made of metal ¼-inch thick. They are tested to a pressure of 4 tons to the square inch. They are carried with the gun in four sections of eight each, two on each side of the gun carriage. Filled with air compressed to 5000 pounds per square inch, or about ⅓ of its original volume, the capacity of each at the working pressure is 17,000 cubic feet of air weighing 11 hundredweight in its compressed condition. Any number out of the four sec-

path with conical rollers, geared together and actuated by a Heenan and Froude spherical engine, the motive power of which also is compressed air. The roller path, which will ultimately be imbedded in concrete, is made in sections of cast iron. It is 21 feet in diameter, and is planed on its surface. The air from the compressor is passed to the reservoirs of the gun carriage through a central pivot or swivel tube. The gun can be loaded, elevated, trained and discharged by one person.

With the gun there is, of course, a special air-compressor, a modification of the high-pressure machines designed by H. Lane for oxygen, hydrogen and carbonic acid. The air is compressed in four stages, the pistons decreasing in diameter

It is in some measure due to Lieutenant Graydon that the apparatus for throwing highly explosive shells considerable distances with accuracy is at present engaging the serious attention of all the powers. The United States Government has not only spent already a great deal of money on this class of weapon, but is setting aside funds for the purchase of 250 of them. There is no doubt that the apparatus found most efficient and convenient for the purpose will ultimately be largely adopted. Five European Governments have sent representatives to Birmingham to see and to report upon the Graydon projector during its construction; and the Chinese, Japanese and South American Governments profess themselves greatly interested in its success.

Peculiar Changes in Values of Old Material.

There may be many readers of *The Iron Age* who are thoroughly conversant with the peculiarities of the scrap iron and steel trade for 20 years or more. Others, and perhaps the great majority, can boast no such familiarity with the subject. All, however, will be interested in the following sketch of the changes in relative values in that time, which has been prepared for us by August Pollak of Chicago, who is a well-known merchant dealing exclusively in this line:

The panic of 1873 had a great effect upon the values of scrap material, and when prices reached "rock-bottom" the principal classes of material were worth about the following figures: Railroad shop wrought scrap from \$18 to \$20 per net ton, railroad track scrap about \$2 per ton less, old iron rails about the same price as railroad track scrap, or the same per gross ton as railroad shop scrap and forge scrap were worth per net ton. Steel scrap, however, was worth considerably more. Railroad leaf, coils and locomotive tires ranged between \$38 and \$43 per net ton, delivered at Pittsburgh, and common mixed country steel, if my memory serves me right, was worth about \$23 to \$25 per net ton, delivered at the steel works.

The boom of 1879-80 brought prices up to such an extent that a comparison of the various values for that time would be useless, as each consumer paid for the class of scrap that he just needed anything that he could get it for. But when prices became more settled again it was found that a great change had taken place. The new cheap processes of making steel enabled manufacturers to make their product from raw material, without being forced to pay the high prices for leaf and coil springs and tires that were in vogue in the seventies.

At present, while No. 1 railroad wrought scrap is worth about the same price as quoted above, as shown by the quotations of *The Iron Age*, coil and leaf springs, instead of bringing from 200 to 250 per cent. as much, are only worth about 75 to 80 per cent. of the price of No. 1 wrought scrap in Chicago, or about 90 per cent. in the Pittsburgh market, where both are used. Coils, which used to bring the same price as leaf, are worth all the way from 5 to 15 per cent. less. Locomotive tires are worth about the same as leaf, but all are worth less than forge or railroad scrap. Another important change is that track scrap and old iron rails, which, as stated above, were worth 5 to 10 per cent. less than No. 1 railroad wrought scrap, are now worth 10 per cent. more than No. 1 wrought.

The chief objection in former days to track scrap was that it contained a large percentage of fish plates, this material being made of old iron rails, which was stock inferior in quality to No. 1 railroad wrought scrap, the offal from selected bar iron. On that account track scrap and old iron rails were worth so much less. Now the large demand for fish plates, spikes and cheap bar iron, which can be made in rolling old rails and old fish plates through in one heat, coupled with the fact that the supply of old iron rails is diminishing yearly, has caused the price of old iron rails, and consequently also old fish plates mixed with spikes, to be in excess of the price of No. 1 railroad wrought scrap, which latter is a better material. Altogether, a comparison of the various values of scrap leads to curious results. Very often steel turnings bring a better price than steel scrap, for the reason that steel turnings can be worked by iron rolling mills, while steel scrap depends upon the open-hearth furnaces for customers. Another interesting feature in the Chicago scrap-iron market is that consumers are

found now in a different locality from former years. Up to 1882 and 1883 most scrap shipped from Chicago found a market with the consumers at, or very near to, Cincinnati, while now not 1 per cent. of the scrap sold in this city is shipped to that market.

American Tin Plates.

Since the question of increasing the tariff on tin plates began to be agitated last year, public opinion in the matter has presented many curious fluctuations. Some people who in the beginning were in favor of a thoroughly protective tariff have come to believe that the new duty of 2½ cents per pound is an imposition, and have consequently thrown themselves into the opposite ranks. On the other hand, many consumers and others who, from the start, were opposed to any increase of tariff have turned about in their feelings, now that plates are beginning to be manufactured, and are at present the strongest advocates of the new policy. The fact that plates are being made in this country in itself is undoubtedly a very strong argument, and will persuade many into regarding the new tariff with favor. During the past week we have received samples from the United States Iron and Tin Plate Company, Limited, Demmler Station, Pa., being sheets of their IX 20 x 28 bright plates. The general appearance of these plates is very creditable; and while it is hardly fair to compare them with the finest grades of the Welsh product, they nevertheless would seem to possess excellent working and wearing qualities. One of the chief difficulties experienced in first making tin plates, we are informed, is in finishing the plates and giving them that smooth, shiny surface that distinguishes the best grade of imported sheets. Perhaps the trouble is due to the black sheets, for the American mills have only recently been called upon to furnish stock for this new work of tinning. To get a smooth, bright surface on the tinned sheet, the black plate must necessarily possess a fine, smooth surface. If the domestic manufacturers only encounter such superficial difficulties, if we may so call them, there is little doubt but that they will be able in time to turn out a satisfactory product.

The plant where these plates, to which we have just referred, are manufactured, has been operating with one stack since the middle of January. The concern, however, are now making changes preparatory to starting a second stack, which they expect will be ready within a month or six weeks, while during the coming summer they hope to increase their works very largely, and in addition will build sheet mills suitable for the manufacture of the black plates. They state that their reason now for only running one stack is that the demand for black plate has been so large that all of their four sheet mills have been kept constantly busy in meeting the demands of customers. Thus far they have been running on a variety of plates, having made coke and charcoal tin, and have also experienced with some new processes that were recommended to do the work more cheaply and satisfactorily. The conclusion, however, which they have reached is that the old palm-oil process is still the best. Their principal object in working is to train their hands to the new employment, and they inform us that the progress they have made has been altogether satisfactory. Their present product amounts to from 40 to 50 boxes per day, which they are selling to large and direct consumers of tin plate, but they hope soon to raise the quality of their output so as to enter the market with a plate that will rank with the very best. Their progress in this

direction will, we know, be watched with keen interest by users of tin plates in all parts of the country.

Trade on the Pacific Coast.

Early this spring three first-class new high-speed steamships will be on the Pacific, continuing the service on the railway line through Canada to China and Japan. The competition with American lines thus created will draw more attention to the importance of the Pacific Coast. In an address delivered before the London Chamber of Commerce, February 10, by Sir George Baden-Powell, M.P., the speaker said:

"As to this Pacific traffic, sufficient attention is not generally given to the very rapid growth of the external trade of the States washed by the Pacific. British Columbia and the Pacific States of America are advancing by leaps and bounds in every respect, and forming great increase in trade. The total external trade of the Pacific islands already exceeds an annual value of £4,000,000. In Japan external trade has risen from an annual value of £12,000,000 in 1884 to £26,000,000 in 1889. In China the increase has been from £41,000,000 in 1886 to £56,000,000 in 1889. In Australasia the growth has been from £60,000,000 to £120,000,000 in value in 15 years. The direct trade between China, Japan and North America has already reached a total of £11,000,000, while the direct trade between Australasia and North America has grown from £700,000 in 1870 to £4,000,000 in 1890. The goods exchanged have varied in some cases, as when wheat was largely shipped to Japan. The Australians, however, habitually take large quantities of 'soft' lumber and preserved fish, while the Canadians are anxious to obtain the fine wools of Australia and the teas and silks of China and Japan. Above all this, it is well known, by all records of trade, that when once you set up lines of steamers between great and growing nations there is no lack of goods either way."

The last sentence in the foregoing should be accentuated—viz., that steamship lines once put in operation between two populous and thriving communities are sure to become established as remunerative investments. This fact has been determined by British experience, after expenditure on a scale before unknown in steamship navigation. Thus encouraged British merchants are about to establish an Atlantic and Australian steamship line, and confidence is felt that "Government aid" will be forthcoming from the countries and colonies benefited. A little later it will be possible to form a more definite opinion of the beneficial effects expected from the American Postal Subsidy bill just passed by Congress.

American exports of canned goods last year were valued at \$11,000,000, almost doubling the shipments of the previous year, and the Agricultural Bureau at Washington warns packers against the danger of injuring their reputation by sending out inferior goods. Attention is called particularly to the new opening in the Brazilian market, where the duty charged under the new treaty is only three-fourths of that charged for similar goods from other countries. The tomato pack in the United States last year was 3,166,177 cases of two dozen tins each, the largest ever made, with the exception of 1888.

The new depot to be erected in St. Louis by the Merchants' Bridge Terminal Company will cost, including improvements connected with it, \$2,000,000.

A New System of Fire Proofing.

This system of fire proofing which is being introduced by the Gibert & Bennett Mfg. Company, with offices at 148 Lake street, Chicago, and 42 and 44 Cliff street, New York City, is based on the fact that wood timbers can be protected against damage by fire by the use of mortar properly applied, and it is well known that wood is desirable for framework on account of its light weight, small cost and readiness with which other material may be secured to it. The important feature of holding the mortar in such a manner as will protect the timbers is claimed to be met by the use of wire lathing employed in connection with Hammond's Metal Furring. The lathing holds the mortar in place, while the furring sets it away from the wood in such a manner as to maintain the air space between the two. By means of the accompanying illustrations we show the manner in which the lathing is attached to wood and brickwork, and also some of the uses to which it is applicable. The Standard "G. & B." Wire Lathing is made by weaving wires in such a way as to form square openings measuring about $\frac{5}{16}$ inch and commonly called "2 $\frac{1}{2}$ mesh." It is usually woven 36 $\frac{1}{2}$ inches wide and put up in rolls 50 yards long. In its manufacture No. 20 steel wire is employed, capable of sustaining, it is claimed, over 80 pounds, so that every foot in width of the lathing has a strength of about 2500 pounds. When the mortar is applied the small strands of wire are said to be completely imbedded, as the articles of mortar, being soft, pass through the openings and unite or cohere on the opposite sides, forming a plastered surface on both sides of the wire. The lathing forming a continuous surface, serves the double purpose of sustaining the wall and binding the mortar together. The amount of metal in the strands of wire is said to be so small that the action of intense heat will not sufficiently affect it to disengage the mortar. Another point to which the manufacturers refer is that the surface will not crack in case the building should settle, or if poorly-seasoned timber is employed. Hammond's Metal Furring, used in connection with this system of fire proofing, is a combination of sheet metal bearings or bridges with steel stiffening rods, fastened to the timbers by means of staples. In Fig. 1 of the illustrations is shown a $\frac{1}{2}$ -inch metal bearing, clearly indicating the manner of fastening the rods to the timber and of holding the lathing in place. This arrangement is such that it keeps the lathing and plaster away from the woodwork, forming an air space between the timbers and the plaster, as indicated in Fig. 2 of the engravings. Another function of Hammond's Metal Furring is that it admits the mortar to form an unbroken plastered surface on the back, the rod and bearings being so small as to become imbedded in the mortar. It also acts, the manufacturers state, as a stiffener and support for the lathing, and where used wood furrings are unnecessary. It is stated that by the use of Hammond's furring the mortar can be applied with the least difficulty and also of a uniform thickness, thus saving both time and material. As each section of the furring is put up it can be spaced to accommodate the timbers. If they are laid far apart the rods come close together, while if the timbers are separated by only a short distance the reverse is the case. If the timbers are placed irregularly the rods may also be irregularly spaced. It will be observed from an inspection of Fig. 1 of the engravings that the bearings are made of flat sheet metal in such a manner that the ends rest against the timbers. They are

made with a slot running transversely to the face for the reception of the staples through which the rods are passed. Two sizes of bearings are made—namely, 1 inch and $\frac{1}{2}$ inch, the former, however, being more extensively employed, for the reason that it sets the plaster sufficiently far away to give an ample air space. In cases where only a small air space is required the $\frac{1}{2}$ -inch bearings can be employed. The stiffening rods are made of No. 9 bright steel wire, and are furnished

cated in the cut, in order to prevent fire from below burning up through, and also to prevent rats and mice from passing from one story to another. Timbers around doorways may be protected by lathing covered with a good body of mortar, as may also the timbers around window frames. In Fig. 4 of the illustrations is indicated the method of applying the "G. & B." system to ceilings, while in Fig. 5 is represented the manner of applying the lathing to brick walls. Between

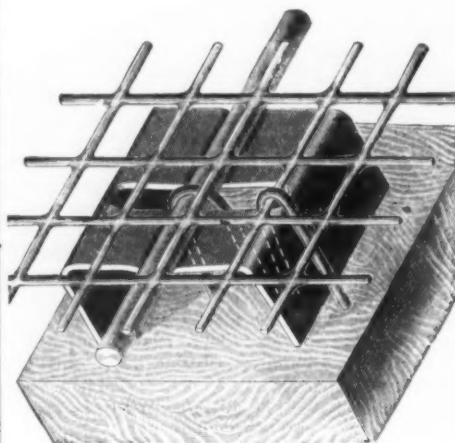


Fig. 1.—Half-Inch Metal Bearing, Showing Manner of Fastening Rods and Lathing.

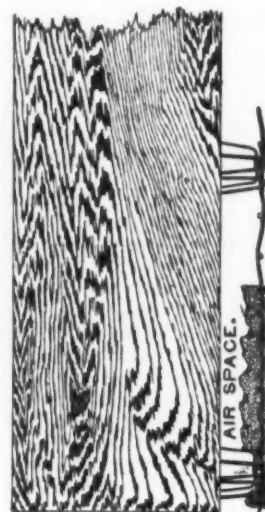


Fig. 2.—End View of Plastered Surface, Showing Air Space Between Lathing and Studding.

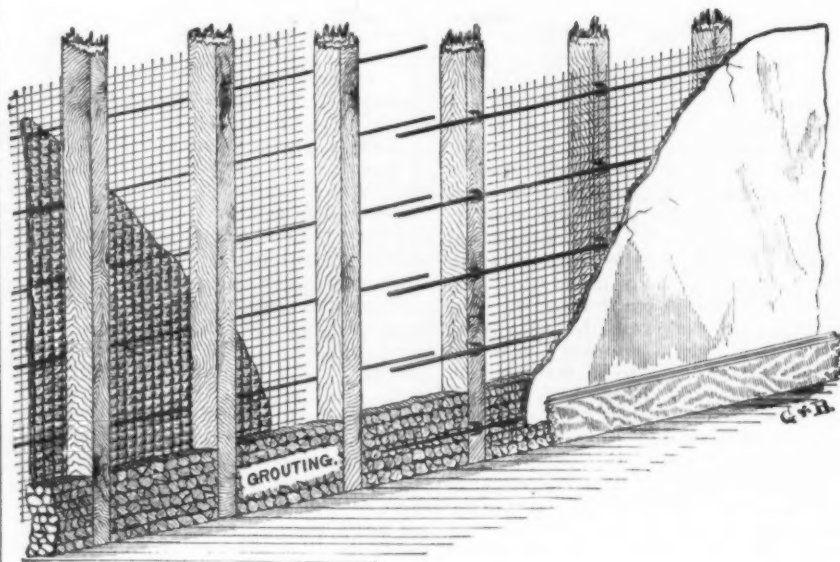


Fig. 3.—Method of Applying the G. & B. System to Partitions.

THE G. & B. SYSTEM OF FIRE PROOFING.

8, 10 and 12 feet long. The staples are made 1 $\frac{1}{4}$ inches long, with $\frac{1}{2}$ -inch bearings, and 2 inches long, with 1-inch bearings. These extend into the wood 1 inch.

The "G. & B." system of fire proofing is adapted for interior walls and ceilings of frame buildings, brick or stone structures, including residences, office and public buildings, theaters, &c., as well as for use around elevator shafts, stairways, areas and hot-air flues. In cases where it is applied to wooden studding for partitions, as shown in Fig. 3 of the engravings, the studs are put up in the usual manner and at the base 6 inches of grouting, consisting of brick and mortar, is filled in, as indi-

every five or six courses of brick a wood lath is laid in order to receive the staples carrying the stiffening rods and lathing. It is stated that entire buildings have been constructed under Gilbert's patent, employing wire lathing with cement for the outer covering of wood framework and wire lathing with plaster for the inner. These buildings have been tested in the cold climate of the North, as well as in the milder climate of Florida, with gratifying results. It is stated that the lathing and furring is so compact that the bulk of the wall is made up of a thick body of mortar, which becomes hard and as firm as a slab of marble.

Convicts Learning Trades.

The fact that convicts are learning trades at training schools, lately established in the reformatory at Concord, N. H., has brought down a storm of indignation from the Journeymen Plumbers' Union of Boston. On learning the fact, a committee promptly proceeded to make an investigation, and found the necessary equipment and 20 young convicts, who were being taught how to draw, bend, upset, weld, punch, &c. Still more ag-

to prostitute our trade and flood the country shops with a host of such characters. How, if such characters are to be taught our trade and allowed to enter the dwellings of our fellow-citizens, with free access to nearly every room in the house—as plumbers generally are allowed—how long, we ask, will it be safe for females to remain in their apartments, or that jewelry and valuables can be exposed in chamber or toilet drawers; in fact, that anything can be safe, while these prowling wretches and sneak thieves

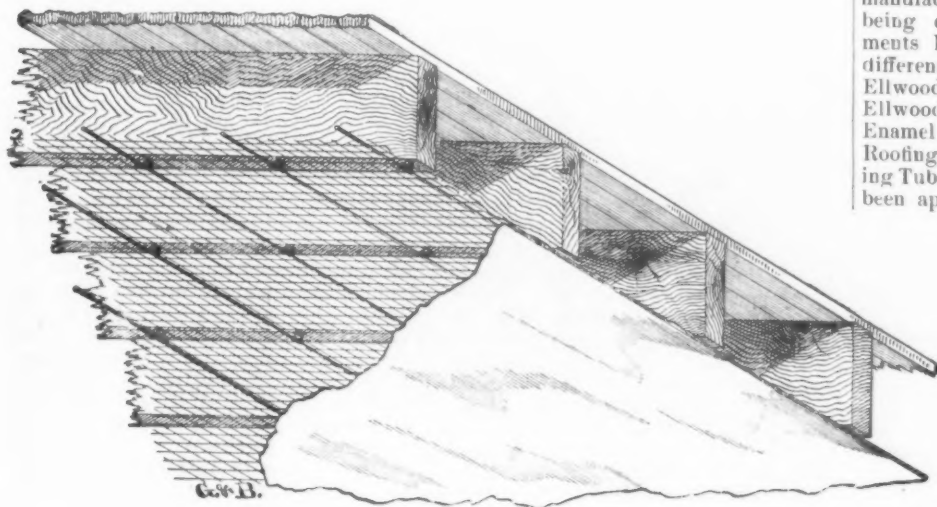


Fig. 4.—Method of Applying the G. & B. System to Ceilings.

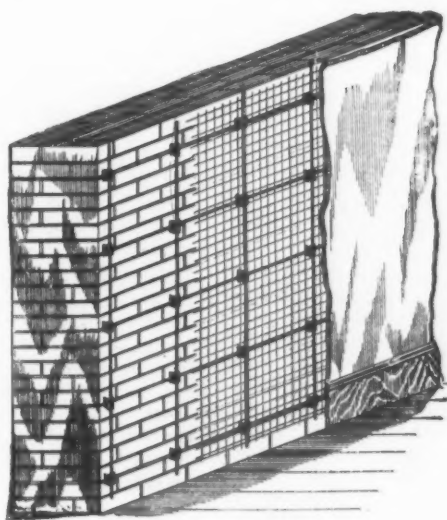


Fig. 5.—Lathing as Applied to Brick Walls.

THE G. & B. SYSTEM OF FIRE PROOFING.

gravating, the committee "came unexpectedly upon a gang of 24 young gallous looking lads learning the art of plumbing," every one thoroughly equipped. The committee say: "Here was a sight to behold." By their sides were gasoline furnaces going in full blast. "They were all working as if on a wager. An instructor was constantly going from one to another. He was evidently taking great pains to teach them the trade. We had come so suddenly and unexpectedly upon the scene that we nearly betrayed the object of our visit." The startling disclosures here spoken of are the result of finding a graduate of the school at work in a shop in Boston, who was "not a union man." The committee say, in conclusion: "Here, then, is our beneficent State preparing, feeding and educating a graceless set of young scamps and convicts

are masquerading as plumbers in the house?" The showing here made is pronounced "simply abominable, disgraceful and criminal," and the trades generally are appealed to that legislators may be brought to their senses, and that the "nefarious system may be abolished."

Thus it would appear that some of our social reformers have a formidable task before them. If all attempts to restore convicts to useful positions in society by teaching them trades must encounter the opposition of organized labor, progress in their department of philanthropic endeavor is doomed to serious embarrassments. Not unlikely one result might be the rise of an opposition no less formidable, with the design of protecting erring citizens from a permanent forfeiture of the right to live, otherwise from perpetual banishment.

Ellwood Industries.

Within a few miles of Beaver Falls, Pa., and about midway between the Erie and Pittsburgh Railroad and the Pittsburgh and Western Railroad, a new town is being erected and will be known as Ellwood. Railroad connections are being made which will give the new town direct connection with both of these railroads. A large hotel is nearly completed, and a number of substantial dwelling houses are now being erected for the use of the workmen who will be employed in the different manufacturing establishments which are being erected there. Already arrangements have been made by which four different concerns will erect plants at Ellwood. These four concerns are the Ellwood Mfg. Company, the Ellwood Enamel Company, the Transparent Wire Roofing Company and the Ellwood Shafting Tube Company. A charter has already been applied for for the last named concern, and they will succeed to the business of the Union Drawn Steel Company of Beaver Falls, Pa., whose plant will be moved to Ellwood. The Ellwood Enamel Company and the Transparent Wire Roofing Company will manufacture specialties which have never before been made in this country. Considerable stock in each of them is owned by English manufacturers, and it was mainly through the efforts of H. W. Hartman, president of the Hartman Mfg. Company, that the inventions were brought to this

country. A representative of *The Iron Age* was shown a sample of the transparent wire roofing by Mr. Hartman a few days ago. The foundation of the roofing is light wire netting, similar to that used in the manufacture of screens. The wire is covered with a composition of gelatine which makes the roofing of the thickness of ordinary window glass. The roofing is destined to take the place of glass in the construction of skylights and other places where a heavy covering is required through which light must pass. The advantages of the roofing are its cheapness and its convenience, as it is flexible and can be wrapped in rolls. Besides, it cannot be broken like glass. The roofing can be made of all colors. It is now used quite extensively abroad, the largest buildings in London being covered with it. The roofing is manufactured by a secret process invented about two years ago.

The Ellwood Shafting Tube Company will manufacture seamless tubes. No similar manufactory is in America, and enormous quantities of the material are imported annually from England. The other companies chartered will also have plants complete in every particular. Several Pittsburgh factories will also be moved to Ellwood. The Ellwood Enamel Company propose to manufacture enamel signs of all descriptions. This industry is also of English invention, and is carried on quite extensively in that country. It is possible that these plants will be in full operation some time during the present year. It is also stated that a number of manufacturing concerns now located in Pittsburgh are contemplating removal to Ellwood.

The powerful fire boats, New Yorker and Zophar Mills, however efficient, are unable to prevent destructive fires on the river front. It was an hour and a half before these boats could subdue the flames that broke out in the cargo of the Hartford steamer City of Richmond, while lying at her wharf in this city, and the upper part of the vessel was destroyed. Loss on hull and cargo about \$50,000.

Industrial Analyses.—II.

*On Some Methods of Analyses of Iron,
Steel and Cast Iron, as Practiced in
Large Industrial Works.*

BY AUGUSTE J. ROSSI, C.E., NEW YORK.

Determination of the Carbon.

The direct determination by combustion or by solution and oxidation by any known approved method is adopted for the total carbon. (See Blair's "Analysis of Iron" and other authors.) The color method is the one exclusively practiced for the determination of the combined carbon. It must be remarked here that iron, and specially steel, do not contain any graphitic carbon, and that since the carbon in these products is in the combined state, the carbon in that latter state represents, in fact, "the total carbon." This explains why, in steel works, the color method is the one almost exclusively resorted to. It is both rapid and sufficiently exact in all cases if the "standards" used for comparison are of a composition known beyond doubt. The analysis of these standards requires the greatest care, and must be made by methods absolutely free from any sources of error.

In cast iron the carbon exists both in a combined state and as graphitic carbon, and, of course, the color method gives only the amount of carbon present in the first of these two states.

COLOR METHOD—EGGERTZ.

The method first suggested by Eggertz is essentially the one adapted in every steel works, but though the principles on which the *modus operandi* is based be the same in general manner, numerous variations have been adopted, and it may be said that each large establishment has its distinct process. However, the principal modifications can be reduced to three characteristic types.

* 1. As practiced at Seraing (Belgium, Cockerill Co.), 0.20 gram of the different samples of steel to be analyzed are dissolved in small glass tubes on the water bath in 10 c. cm. of nitric acid of specific gravity = 1.2, taking the proper care to avoid loss. Samples of the same weight, 0.20 gram, of normal standard steels of all possible different known carbon contents, comprising within their limits the extreme percentages one way or the other, low or high allowed or required in regular manufacture are also dissolved in 10 c. cm. of nitric acid, specific gravity = 1.2, simultaneously and in the same manner. At Seraing the extreme limit of carbon is 0.60 per cent. All the tubes are then heated simultaneously to 90° C. for one hour or more until the combined carbon, first precipitated in flocculent-blackish clouds, is gradually dissolved. The tubes are then cooled by dipping them in cold water, and the solutions transferred to a series of cylindrical small glass tubes of the same diameter and thickness, which are filled up to the same mark for all. The different shades of the solutions of the "standards" and of the samples to be tested are then compared, and it is ascertained between which two "standards" falls the shade of the solution of each of the specimens to be analyzed. From this comparison the tenure in carbon is esti-

mated. An assay is considered good when, made by two different operators, their results agree within 0.02 per cent. This method requires a great deal of practice and judgment on the part of the operator.

* 2. At Rothe-Erde (near Aachen), they proceed as follows: They adopt three normal steels, one containing 0.005, the second 0.13 and the third 0.25 per cent. carbon; these figures may be changed, but which is important is to use one normal standard steel containing less than 0.10 per cent., another having a tenure in carbon comprised between 0.10 and 0.20, the third between 0.20 and 0.50, and in case very hard steels are also manufactured in the works, one having a tenure in carbon comprised between 0.50 and 0.70 per cent. and even up to 0.80 per cent. maximum limit of hard steel. Samples of 0.20 gram of the normal steels and of each of the steels to be tested are weighed and dissolved in small glass tubes in 5 c. cm. nitric acid of specific gravity 1.2 on the water bath at a temperature which must not reach above 80° C. The solutions of the standards are then thoroughly cooled and transferred to cylindrical glasses carefully graduated in cubic centimeters, the washings of the tubes being added. These solutions are then diluted with water until their levels come exactly to an even division of the glass, which is noted. The solutions of the steels to be tested, cooled in the same manner, are also transferred to cylindrical glasses similar in every respect to the first, the washings added, and they are diluted with water until the same shade as that of the standard steel solution estimated to be the nearest to its composition is obtained, the number of divisions occupied by the liquid are then read, and we have then the following proportion:

Known.	Unknown.	Known.	Unknown.
Tenure in carbon of the normal steel	Tenure in carbon of the sample tested.	No. of c. cm. of the standard steel solution	No. of c. cm. of the solution of steel tested.
:	::	:	:

A difference of 0.02 per cent. between two consecutive tests of the same steel is the extreme admitted.

† 3. The third variation from the Eggertz method is practiced as follows at Liège (Belgium) Société d'Angleur. They use a Duboscq colorimeter, of which the construction is based on this principle: Two solutions of the same substance which, examined under a different thickness, have the same shade, contain quantities of the substance inversely proportioned to their thicknesses. The apparatus is essentially composed of two glass cups of the same diameter and thickness. In the interior of each of these cups can be lowered a small cylinder of unpolished glass. The vertical motion of these cylinders within the cups is regulated by means of a system of screw and rack; a vernier connected with the screw and moving on a straight scale graduated to the millimeter allows reading to the millimeter the amount of motion imparted to the cylinder of each cup. A reflecting mirror inclined at 45° concentrates the rays of light toward the bottom of the cups. These rays penetrate into the interior of the small cylinders through the whole length of the latter, and are received on a double refraction prism provided with a small telescope. The disposition of the system is such that the optic field of the telescope receives the rays of light reflected by each cup in the interior of the cylinders, each pencil of rays occupying half of the field of vision. An horizontal reticule stretched according to a diameter of the lens mark the limits of each pencil of light. To guard against any deperdition of light by diffusion, whenever the apparatus is used the two cups are protected by a kind of camera obscura in

wood. The operation is conducted as follows:

The characteristic point of the method is that only one solution of one normal steel is required, whatever may be carbon contents of the specimen to be tested. 0.20 gram of a normal steel containing say 0.340 per cent. carbon is dissolved in 10 c. cm. of nitric acid, specific gravity = 1.2, and an equal weight, 0.20 gram, of the specimen to be analyzed is treated in exactly the same manner. The liquids are heated to 80° or 85° C., and, after three-quarters of an hour to one hour, the solution of the flakes of carbon is generally completed. The tubes containing the solutions are cooled in water, and as a small amount of nitric acid might have been evaporated, one drop to two drops are added. One of the cups is then filled with the solution of the normal steel and the corresponding glass cylinder is lowered down by means of the screw until the zero of the vernier coincides with the division corresponding to its tenure in carbon, as read on a scale graduated in advance according to a conventional table. The other cup is then filled with the solution to be tested, and looking through the glass of the telescope, the second cylinder is lowered in its turn until a complete equality of tints is obtained in the field of the glass; the corresponding division of the scale is then read. Let a and a' be the tenure of the normal and tested solution in carbon, b b' the respective heights read on the scale. $\frac{a}{a'} = \frac{b'}{b}$; $a' = \frac{ab}{b'}$; a discrepancy of $\frac{1}{1000}$ between two consecutive determinations and 0.02 per cent. is the only margin admitted for the same sample.

When dealing with extra fine steels, very soft steels, the normal type of steel is changed, because, as it is strongly colored, while the tint of the very soft steel is very light, it would become necessary, to obtain the equality of shade, to make the thicknesses of the liquid vary beyond the limits of motion of the apparatus. In such cases the normal steel adopted has a tenure in carbon of only 0.03 per cent. or thereabout.

This method is the most rational and gives very accurate results, agreeing, it is claimed, perfectly with those obtained by direct analysis. The Seraing method requires the dissolving of a series of normal steels, necessitating numerous weighings. The appreciation of the tints being made between two limits which are of necessity and relatively not very approximate, great accuracy is not admissible.

The Rothe-Erde process is far from being exact, since it is based on the admission that two solutions of iron carbides, having the same tint, contain the same quantities of carbon, a fact which is not yet proved. It requires besides the solution of three normal steels at least. The colorimeter used for determining the discoloring power of bone black on molasses has been used at the arsenal of Malines in the practice of this third method and has, it is claimed, given remarkably exact results. The normal solutions must be prepared when they are wanted for use. They have to be kept protected from light if not used immediately and they cannot be surely depended upon after a few hours. The best way is always to treat the normal steels and the steels to be tested simultaneously and in identically the same manner. However, in some establishments the standard solutions are prepared beforehand and kept for use when they are wanted. Filtering of the solutions has been advised, but it is not to be recommended, as these results from this practice a loss of both time and solution.*

* Di Mattes Genie Civil, 1883.

* Ibidem. † Ibidem.

* Di Mattes Genie Civil, 1883.

The Terrenoire method is a sort of combination of the direct and color processes. It has been published in *Stahl und Eisen*, 1889, as described by the author, Mr. Clerc, before the Société de l'Industrie Minérale. One gram, more or less, of the sample, according to carbon contents, is digested in a tubulated glass retort containing a solution of 5 grams. of copper sulphate in 30 to 40 c. cm. of water. The retort is heated until a solution of the sample is obtained and the solution allowed to settle. The clear liquid is decanted by syphoning, taking great care not to carry with it any particle of the solid residue; 30 to 35 c. cm. of pure concentrated sulphuric acid are then added to the residue and after cooling 4 to 5 grams of crystals of pure chromic acid. The quantity of carbonic acid formed by the oxidizing action of the chromic acid on the carbon is determined by absorption of the gas—not by caustic potash, as usually practiced, but by neutral carbonate of the same base.

The absorption apparatus consists of a series of U tubes containing each exactly 1 c. cm. of a solution of the neutral carbonate titrated in such a manner that, when it is saturated with carbonic acid and transformed into bicarbonate, it represents exactly 0.0005 of carbon. This solution is obtained by dissolving 4.15 grams of pure neutral carbonate of potash in 1 liter of water. To indicate the turning point of the saturation potassium manganate is added to the solution of neutral carbonate (about 0.025 gram for each 60 c. cm.), which colors the solution to a pink shade by the formation of potassium permanganate as soon as the alkaline carbonate is transformed into bi-carbonate. Since each U tube corresponds to a constant percentage of carbon, the number of tubes colored during the operation gives the quantity of carbon at 0.0005 near, or its tenure at 0.05 per cent. near, as the greatest possible discrepancy and that without any calculations or weighing. If greater accuracy were desired the neutral carbonate solution could be titrated accordingly. The operation is conducted as follows. The retort is first heated so as to bring its contents near the boiling point; then the U tubes are connected and the heat moderated or increased, according to the rapidity of the evolution of gas. To prevent the too rapid absorption of carbonic acid in several of the U tubes at the same time, the regularity of the current is obtained as often practised in laboratories, by means of what is known as an "aspirator"—a large bottle connected at the end of the series of the U tubes and filled with water, of which the flow is regulated by means of a cock. The two first U tubes, the nearest to the retort, are used as guard tubes to intercept any projections of liquid from the retort and do not contain any of the solution of neutral carbonate.

The titration of the potassium carbonate solution, titration obtained by direct weighing, must be checked by carrying a blank operation with a mixture containing a known quantity of carbon. The pure crystallized sodium carbonate can be substituted for the potassium carbonate (0.0441 gram Na_2CO_3 corresponding exactly to 0.005 carbon), by dissolving 4.41 grams Na_2CO_3 in 1000 c. cm. of water each cubic centimeter of solution corresponds to 0.0005 carbon. The method can be applied to iron, steel and cast iron, and as far as residues are concerned the following tests, A and B, which have been made of the same specimens by this method and Boussingault's method, seem to establish it beyond doubt. It is considered in several works preferable in many respects to the others actually practiced. It only requires one weighing, there is no loss of time, no filtering, no washing of precipitates, no calculations and it is also a color method. One

chemist with one assistant, it is claimed can make readily 14 such analyses in one day.

Carbon found in.	A—By method No. 5.	B—By Boussingault's direct method.
Steel.....	0.25	0.20
Open hearth steel.....	0.425	0.38
Watch spring.....	0.325	0.29
Watch spring.....	0.525	0.50
Iron bar.....	0.295	0.275
Cast steel.....	(0.620)	0.63
Cast iron.....	(0.610)	1.93
	1.95	

The New Fraser & Chalmers Plant.

Our readers have already been apprised of the fact that Fraser & Chalmers of Chicago contemplate the erection in that city of a new and very extensive plant for the manufacture of mining machinery. It will be located in a different part of the city from their old works. As a matter of public interest we reprint below an article on the subject taken from the *Chicago Economist*, which sets forth from the architects' standpoint the plans of the firm. It will be observed that the erection of only a portion of the new plant is to be undertaken at present. How soon the remainder will be put under contract is not yet known.

The site of this establishment covers 550,800 square feet, or over 12 acres, and lies between Fillmore and Twelfth streets on the north and south and Rockwell street and Fairfield avenue on the east and west. The plans provide for 13 buildings to cover over 8 acres. The estimated cost of the entire plant, including equipment, is over \$1,000,000. It is intended to erect only four buildings, the foundry, pattern-storage building, boiler shop and powerhouse, at the present time, the cost of this portion being about \$300,000, not including equipment.

The plans were prepared by Architects Raeder, Coffin & Crocker, and, in addition to the usual designs for the construction, include the location of the buildings, railroad tracks, equipment and all the large machinery required. The principal frontages of the buildings are along Twelfth street and Washtenaw avenue. The frontage on Twelfth street is 762 feet, and there the more important structures will be built, being the office, foundry and pattern-storage building. The office will be built at the northeast corner of Twelfth street and Washtenaw avenue, with a frontage of 158 feet on the former by 75 feet on the latter. It will be of brick, three stories high and fire proof. A feature of the office will be the drafting room, which will occupy the entire third floor. The north side of this section of the building will be constructed entirely of glass. There will also be a skylight. The hallways and rooms will be elaborately finished in oak.

Immediately opposite the office, at the northeast corner of the same streets, the pattern-storage building will stand. This will be four stories, 138 feet on Twelfth street and 100 feet on Washtenaw avenue. In the rear of this building will be the shafting department, with a frontage on Washtenaw avenue of 155 feet and a depth of 60 feet. The rough casting shop, 30 x 40 feet, three stories, will adjoin this. The foundry will be one story high, and will have a frontage of 400 feet on Twelfth street and a depth of 154 feet. In the rear of these buildings will be the cleaning room, 93 x 91 feet, the machine shop, tool and supply room, fronting west on Washtenaw avenue, the former 160 x 255 feet, with a gallery 40 x 310 feet extending around the entire shop. The tool and supply room is 55 x 160 feet. Fronting east along Washtenaw avenue from Twelfth

street north to the railroad tracks, a distance of 796 feet, and beginning at the first building from the office, which stands on the corner, is the punch room, 50 x 100; the wood room, 150 x 133; then comes the boiler shop, 133 x 400. In the northeastern section of the plant, which is partially encircled by the tracks of the Wisconsin Central Railroad, are located the boiler room, 60 x 100; engine and dynamo room, 60 x 80; furnace room, 40 x 80; bolt room, 60 x 45; blacksmith shop, 60 x 175; shipping room, 240 x 50; erecting shop, 100 x 210, with a gallery connecting with and extending around the machine shop, 40 x 310 feet.

The buildings will all be constructed of brick, with a roof of a combination of wood and iron. Where wood is used slow-burning construction will be adopted. Power and light will be supplied from a central station, from which a huge smoke-stack 6 feet in diameter will extend 150 feet in the air. The interior arrangement of the buildings, as well as their grouping, has been carefully carried out with a view to quickly and economically disposing of the business of the company. The equipment will be of the latest and most approved pattern, both for handling the material and machinery in process of manufacture by cranes and other special machinery. In the boiler shop hydraulic riveting machinery will be used. Facilities for the transportation of material and the product to and from the works are excellent. The tracks of the Wisconsin Central encircle the northwestern portion, while the tracks of the Chicago and Northwestern and the Pan-Handle Railroads extend along the works to the east. A number of switches from these lines cross the grounds and connect with all the principal buildings, and these main tracks are paralleled by narrow-gauge tracks, thus giving closer communication than afforded by the main switches.

Moisture in Lake Ore.

A meeting of the pig iron manufacturers, composing the Mahoning and Shenango Valley Iron Manufacturers' Association, was recently held in the office of the association at Youngstown, Ohio. There were present Messrs. H. O. Bonnell, J. G. Butler, Jr., W. Scott Bonnell, James Neilson, L. E. Cochran, E. L. Ford, Robert Bently and W. J. Hitchcock of Youngstown; H. B. Shields of Girard; Frank Buhl and E. A. Wheeler of Sharon, and James B. Pierce, John J. Spearman and Geo. D. Kelly of Sharpsville. Nothing new regarding the shut down of the blast furnaces in the Mahoning and Shenango valleys was brought up. It was the unanimous opinion of those present that there would be no change in the situation until a settlement of the coke strike has been effected. The question of this year's supply of iron ore was the principal one before the meeting, and was earnestly discussed. About this time every year, just before the opening of navigation, the ore supply comes up for consideration, but this year a new phase of the subject has been developed. This is in relation to the sampling of ores. The furnace owners strongly object to paying for so much moisture, and a conference with the ore companies, for the purpose of discussing the matter, will probably be had.

In an interview, J. G. Butler, Jr., general manager of the Brier Hill Iron and Coal Company of Youngstown, Ohio, expressed his views on the subject as follows:

There has been a good deal of dissatisfaction among buyers of ore regarding the methods of sampling it, as it comes to the Lake Erie docks from the Lake Superior region. Rattle & Nye of Cleveland have been the arbiters between the ore

companies, selling, and the furnace companies, buying. These gentlemen are chemists, well qualified in their business. For the past two years they have had a crusher at each of the important Lake Erie ports, and when a vessel laden with ore arrives they put men at work sampling the cargo in a thorough way. The ore companies object to this plan. The old method was to pick out a chunk of ore here and there, find its composition, and take the whole load at a rough guess. This was very unsatisfactory to the buyers, and there had been a good deal of complaint prior to the adoption of the system which has lately been in use.

There is more or less criticism in regard to the amount of moisture which is received in the ore. Some furnacemen assert that they are paying for a great deal of ore which is not ore at all, but water. This trouble has been taken in hand by the Mahoning and Shenango Valley Iron Manufacturers' Association, and a conference will be asked with the leading ore companies. A proper adjustment of the matter is of the greatest importance to all consumers of Lake Superior ores.

Ore companies have insisted upon the furnace companies taking an average analysis of all the ore placed on the docks. Different cargoes come in varying from 3 to 5 per cent. in metallic iron and the ore is all dumped together. The result is that when the ore gets to the furnaces one will have from 3 to 5 per cent. lower grade of ore than a neighboring furnace. The question of moisture is considered in the Eastern market with much more care than here, with the result that the Eastern furnaces come nearer to getting what they pay for that we.

Pressure-Reducing and Pressure-Regulating Valves

The necessity of reducing and regulating the initial pressures of steam, water and gas has produced numerous devices known as pressure-reducing valves, pressure-controlling valves, pressure governors, equalizing valves, pressure regulators and pressure regulating valves. For all these constructions it is claimed, generally, that the reduced or lower pressure is maintained uniform, whether there be any increase or decrease in the initial or high pressure, and they are therefore called pressure-regulation valves. All the valves of this class may be divided under two heads, viz.: Pressure-reducing valves and pressure-regulating valves.

A reduced pressure may be obtained with an ordinary stop valve by partially opening the valve by the hand. Under such circumstances the initial or high pressure will have to be constant—that is, without fluctuation or change—and the consumption of the steam, water or gas on the reduced-pressure side must also be constant. To maintain a uniform reduced or low pressure when the initial or high pressure increases the valve-opening area will have to be reduced—that is, the valve will have to be closed a little—and when the high pressure decreases the valve will have to be opened a little. When the initial or high pressure is constant and the consumption of the steam, water or gas on the reduced or low pressure is fluctuating and irregular—that is, sometimes large and at other times almost nothing—the valve has to be partially opened and closed respectively, to meet the demand and maintain a uniform low pressure. If the high pressure on the one side and the consumption of the low pressure on the other side are both variable, the motion of the valve will have to be such as to furnish sufficient steam, water or gas from the variable high-pressure side to maintain a uniform pressure to the fluctuating consumption on the low-pressure side. When

a steam valve is used in this manner, it is termed "wire drawing" or "throttling" the steam, and a singing or hissing sound is produced which it is desirable to overcome in the pressure-regulating valve. It is therefore apparent that for every fluctuation or minute change in the initial or high pressure or in the consumption of the steam, water or gas on the reduced or low-pressure side the valve opening has to

and weights, diaphragms with dead weights—that is, weights without levers—and devices to reduce friction of parts so as to produce a sensitive valve. Fig. 1 illustrates a pressure-reducing valve, consisting of an ordinary stop valve to the spindle of which a lever is attached which supports a weight at one end. In place of this weight a strong steel spiral spring may be used, one end being con-

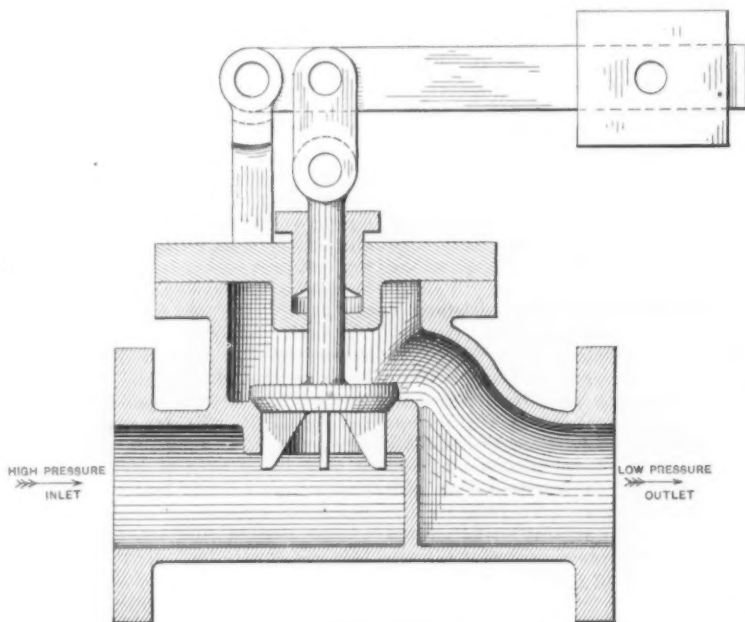


Fig. 1.—Pressure-Reducing Valve.

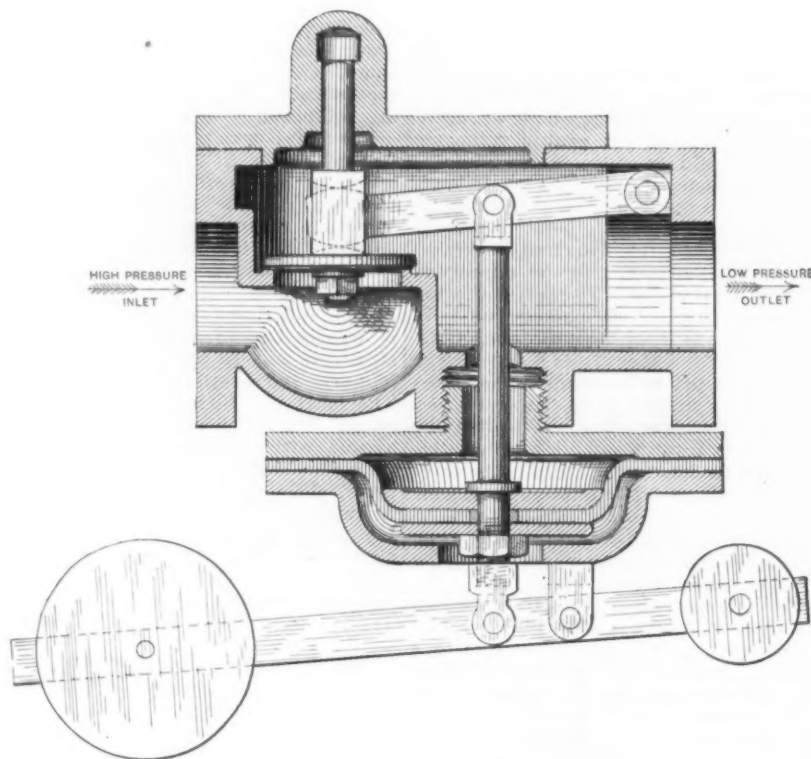


Fig. 2.—Pressure-Reducing Valve, with Diaphragm, Levers and Weights.

be increased or decreased, and when a valve is used in this manner it requires constant attention. To automatically control the opening of the valve is the object sought for in the numerous designs of pressure-reducing and pressure-regulating valves. To attain this end the additional mechanisms used on the ordinary stop or equilibrium valves are the lever and weight, the lever and spiral spring, the spiral spring, diaphragm of the most pliable material, diaphragms with levers

connected to the body of the valve casting and the other to the lever, with an adjustable screw for compressing or opening the spring. To adjust this valve the weight is moved on the lever, so that the high pressure which enters beneath the valve will raise and open the valve sufficiently to produce a reduced pressure on the upper side of valve. The weight on the lever and the low pressure oppose the high pressure in raising the valve, and when adjusted to definite low pressure

any increase of high pressure will open the valve and slightly increase the low pressure if the consumption is constant, and a reduction of high pressure will tend to close the valve and reduce the low

Fig 2 presents a reducing valve composed of an ordinary stop valve with internal and external levers, diaphragm and weights. The high pressure enters beneath valve. If the weights on the

sure beneath the valve will open it, and admit pressure until a pressure of 10 pounds is on the diaphragm, when it will close the valve against the high pressure. If the weight on the lever to the left of the diagram, Fig. 2, is moved toward the outer end of the lever the reduced or low pressure on the diaphragm necessary to close the valve will be reduced, and if the weight on the right is moved toward the inner end of the lever that pressure on the diaphragm will be increased. When this valve is set to definite high or low pressures any fluctuation in the initial or high pressures will affect the low or reduced pressure, but the low or reduced pressure will increase in the same proportion to the increased high pressure as that at which it was set. This form of valve does not, therefore, maintain a uniform reduced pressure, and is simply a pressure-reducing valve.

Fig. 3 is a high-pressure equilibrium piston valve, with the under surface of the lower piston exposed to the lower or reduced pressure. The high pressure enters the valve between the two equal arms of the piston valves, thus placing them in equilibrium. The weight on the lever is adjusted so that the required low or reduced pressure, acting on the under side

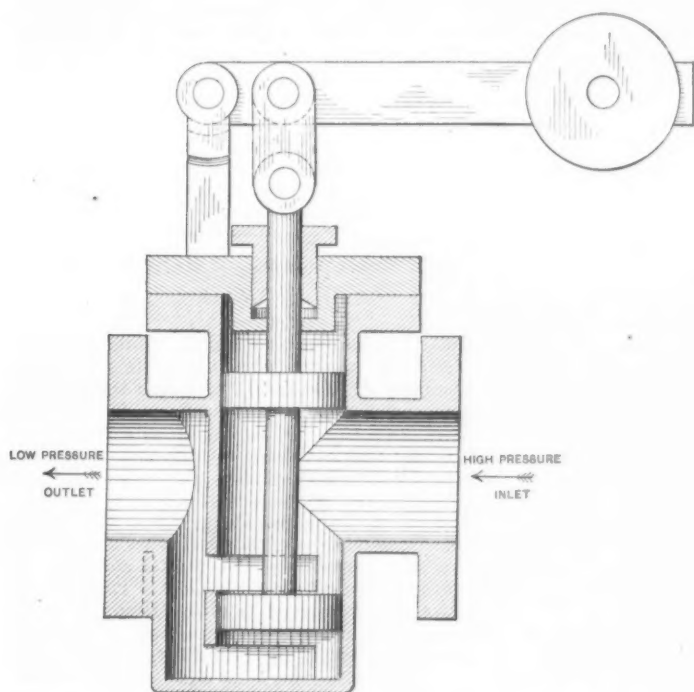


Fig. 3.—Pressure-Regulating Valve, with Equilibrium Piston Valve, Lever and Weight.

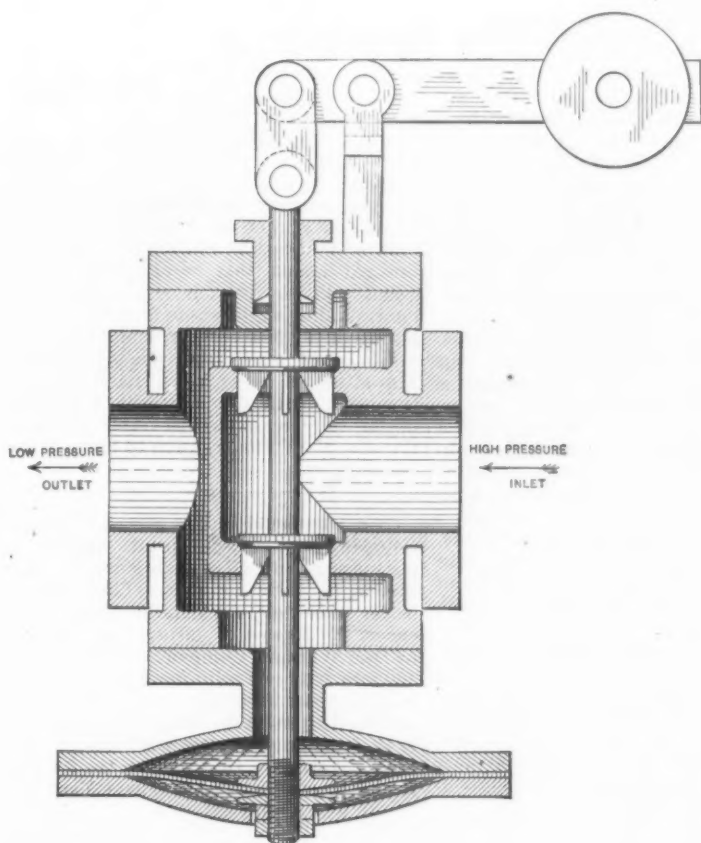


Fig. 4.—Pressure-Regulating Valve, with Equilibrium Valve, Diaphragm, Lever and Weight.

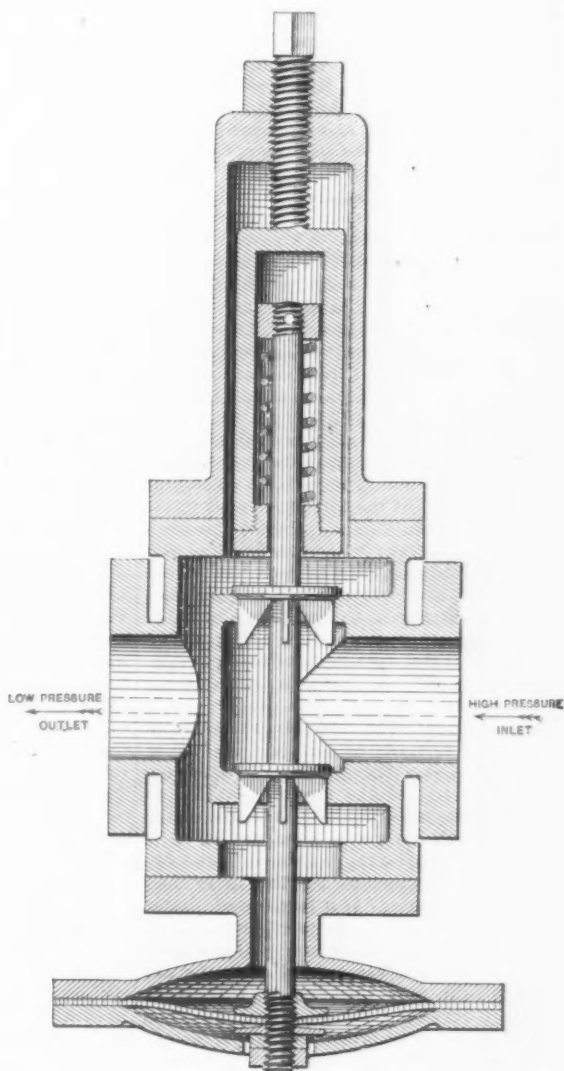


Fig. 5.—Pressure-Regulating Valve, with Equilibrium Valve, Diaphragm and Spiral Steel Spring.

pressure. This design of valve is heretofore a "pressure-reducing" valve only. The friction due to the spindle passing through the stuffing box may be reduced by the use of center steel point bearings.

external levers are adjusted so as to place the valve, levers and diaphragm in equilibrium, the area of the diaphragm being much larger than that of the valve—say, ten to one—100 pounds pres-

of the lower piston, will raise it up and close, or nearly close, the opening or port in the cylinder. By this arrangement fluctuations in the higher or initial pressure do not affect the motion or work-

ing of the valve, and without regard to that pressure the low or reduced pressure will close the port or opening whenever the latter pressure to which it has been set will have been attained. Thus, if the high pressure is 100 pounds and the reduced pressure 5 pounds, the weight on the lever is set so as to allow a pressure of 5 pounds to raise the lower piston so as to close the port or opening. If the high pressure is lowered to 50 pounds pressure it still requires 5 pounds pressure to raise the lower piston to close the port or opening, and the area of that opening will be such as to permit enough steam, water or gas to pass through to maintain the desired reduced pressure, notwithstanding the variability of the initial or high pressure and the irregularity of the consumption of the low or reduced pressure. This design illustrates the principle of the pressure-regulating valve. The objections in practice to this form are mechanical—that is, the piston valves are liable to be too tight a fit, but if the friction so produced, as well as that in the stuffing box round the piston or valve spindle, were withdrawn, it would be a pressure-regulating valve with two parts.

Fig. 4 illustrates a design of pressure-regulating valve with a valve in equilibrium in the high or initial pressure and in the low or reduced pressure, with diaphragm, lever and weight. The diaphragm being of a large area relatively to the valve area, the low pressure on it gives more force and makes the motion of the valve more sensitive than in the form shown in Fig. 3. As the weight is placed toward the end of the lever when adjusting the valve the reduced pressure will be increased, and decreased when pushed toward the fulcrum, because the low pressure has to raise the weight to close the valves. In setting this valve the low or reduced pressure determines the position of the weight on the lever, as the fluctuations of the high or initial pressure do not affect the motion of the valve. The motion of the valve being due to the low pressure it will not close until the limit of that low pressure is attained, no matter what the high pressure may be. It is, therefore, apparent that irregular consumption on the low or reduced pressure side will be provided for, so that if there is no consumption, the limit of the low or reduced pressure having been attained, the low pressure on the diaphragm will actually close the valve, notwithstanding any increase in the initial or high pressure. The first mechanical objection to the design of valve in Fig. 4 is the presence of packing round the valve spindle, producing irregular friction. This is overcome by attaching the lever and weight to the diaphragm in the same manner as shown by the external lever and weights in Fig. 2. The other disadvantage is the use of a diaphragm and the extent of the motion required in the diaphragm, so that the full area of the opening will be given when the valve is open. The advantages gained in the use of the diaphragm are probably more than its disadvantages. If it is made of pliable material, large in diameter, with large openings in the valve seats, so that a small lift to the two valves will give the full area of the pipe opening, it will work without renewal for some years, and when its application is properly made it is not difficult to replace.

Fig. 5 represents a similar form of pressure regulating valve to the one shown in Fig. 4, except that a spiral steel spring is used in place of a lever and weight. By compressing the spring the reduced or low pressure is increased; this is done by screwing up the set screw until the required low pressure is attained; it is then secured in position by the lock nut. Some consider the use of steel springs a disadvantage, while others claim that they are now so well made that there is no in-

convenience caused by their use, and, furthermore, they give a neater external appearance to the valve than the lever and weight.

The five forms of valves illustrated contain the general principles which are used in the construction of pressure-regulating valves. If diaphragms are not used, pistons of more or less large comparative area are adopted; where weights or levers and weights are dispensed with they are replaced by springs. In selecting pressure-regulating valves it will be always desirable to distinguish the difference between them and pressure-reducing valves. A governor that is designed as a pressure-reducing valve cannot be a regulator of pressure. It is easier to regulate and reduce the pressure from 400 pounds to 1 pound than from 1 pound to $\frac{1}{10}$ pound. In a pressure-regulating valve the motion of the valve should be dependent on the low or reduced pressure. To be quick and sensitive in action, the area on which the low pressure acts should be large. The fewer parts in such devices the less friction there is to overcome. Where diaphragms are used the motion in them should be as little as possible, and when of pliable material, they should be covered with water. Where lever and weight are used a fixed weight on the lever, with an adjustable fulcrum, reduces the loose parts of such valves. The valve should be compact in its design, and, as it were, self-contained, with as few external parts as possible, for which reason the use of a well made spring may be preferable to lever and weights. Although there are many forms and designs of pressure-reducing and pressure-regulating valves constructed and used, there is still room for improvement in them.

Stability in Freight Rates.

The status and plans of the New Western Traffic Association are most ably set out by Chairman Aldace F. Walker in a paper in the *Railway Age*. After explaining that the objects of existing organizations are the establishment and publication of reasonable rates which shall not discriminate between competitive producing points and competitive markets, and the maintenance of rates without discrimination between shippers and without rate wars, and the making of these rates stable, so that manufacturers and shippers know what to expect, Mr. Walker points out wherein the Western Traffic Association is better than other associations hitherto organized. His first point, of course, is that it applies a similarity of methods throughout a large extent of territory, which is required by the fact that the entire territory is covered by conditions making a uniformity of adjustment indispensable. Then his second point is no less important—the giving a broader and more efficient scope to the principle of arbitration, which comes in play in default of agreements between the lines upon disputed points. The fear that rates unreasonably high may be imposed Mr. Walker stamps as ridiculous, for he says rates throughout the United States are almost universally subject to conditions over which railway managers have no control. The great public danger at the present time is the forced reduction in railway rates to a point where efficiency and safety of service will be endangered, and which will prevent the introduction of necessary improvements. The new association is neither a trust nor a pool, but if Congress should legalize pooling, as, in his opinion, it ought to do, subsidiary agreements would be made as adjuncts to the existing association. Minor lines are fully protected by the fact that the business which they originate is of value to their connections, all of which have always been ready to pay more than

liberally in the divisions of the rates for an opportunity to participate therein. In the territory in question, however, there are few lines of this character, but the establishment of just rates upon competitive traffic and the maintenance of such rates when fixed is distinctly to their interest. It is not contemplated to replace existing associations, but to make them divisions of the larger association, the change being one rather in name than in substance. Mr. Walker adds that if advantages are perceived to result from the working of the new association there is every probability that all lines necessary to its complete success will soon join its membership.

Consolidation of Malleable Iron Works.

An important working arrangement between the extensive malleable iron interests at Cleveland, Chicago, Indianapolis and Toledo, is announced. The new organization will be known as the National Malleable Castings Company, and will have its headquarters at Cleveland, Ohio. The following officers have been selected: A. A. Pope, president; E. L. Wittemore, vice-president, and O. K. Brooks secretary and treasurer. The capital stock of the new concern is \$3,000,000. The management represent that the change brought about is not in the nature of the formation of a trust, neither the consolidation of competing interests, nor yet the establishment, or attempted establishment, of a monopoly. Eastern manufacturers, possessed of means and large experience in malleable iron founding, who had to do with establishing the Chicago Malleable Iron Company in 1873, and the Indianapolis Company, subsequently became interested in the Cleveland Malleable Iron Company, the oldest of the four companies, and in the establishment with Mr. Pope and others of the Toledo Works. The mutual interests referred to had effected comparative harmony in the past, but as local interests were large, and increased with the growth of the business through intersecting managers and superintendents at each point, it was recognized that a unification of interests might be brought about that would lead to the quieting of any prejudice to these local interests that might ensue from the building up of the new enterprise at Toledo, by diversion of work from the older shops. This situation being the primary suggestion, was, with the necessity for added capital to increase facilities and establish the new plant, the occasion of uniting the interests.

The American Pig Iron Storage Warrant Company have sent out prints made from photographs of two of their storage yards, typical of their methods. They give a better idea than any detailed description can of the manner of piling iron adopted by the Warrant Company. Each lot of 100 tons is in one solid mass, so piled that it will remain intact for years. The space occupied by 100 tons piled in this manner is 12 feet long, 10 feet wide and 8 feet high. Yard No. 15, of which the interior is shown, contains 12,300 tons. Yard No. 11, of which the exterior is illustrated, contains 8100 tons. The yards are about 120 feet wide, 600 feet long, and have a capacity of about 40,000 tons each.

The site for a stone to mark the starting point of the first locomotive ever used in this country, "John Bull, No. 1," was located near the Mile Hollow, near Bordentown, N. J., by the Pennsylvania Railroad, recently. Around the base there will be a railing composed of the rail and spikes of those early days.

WELDING COPPER.

A Revolutionary Invention.

Those interested in the copper and brass industries have been startled recently by the exhibition of samples in Chicago, New York and Waterbury, Conn., of copper welding by Mortimer McRoberts, who is manager of the Chicago branch of Plume

cient velocity, the diameter of the tube was reduced according to the shape of the die.

We can best explain the simple process and the results obtained by referring to the accompanying drawings. When a hard-metal die or former, D, Fig. 1, is mounted upon a spindle of the lathe and the die is given a longitudinal perforation and revolved at a suitable speed, a tube, T, on being made to enter the die, has its

out in the different parts of the tube after treatment.

When a tube is made to enter a die which is not perforated but is simply provided with a cavity, then the effect of the operation is to weld together the end of the tube, causing it to assume the form prescribed by the shape of the die. Figs. 4 and 5 show the die and the tube first at the moment when it is about to enter the die, and then at the time when the end of the tube has been welded together. If it is found desirable to reduce the size of the tube first, and subsequently to close its reduced end, the tube is forced through a die of the general form of Fig. 2, and when the reduction has proceeded far enough is allowed to abut against the second die, which closes the end.

The most extraordinary results have been attained by this simple method, coupled with the facility for welding which practice developed. Thus Fig. 6 shows in section the arrangement of the die for welding together two tubes, *t*, and a slightly larger tube, *u*. The first, *T*, has had its end reduced, as at *p*, to enable it to be inserted into the tube *u*. Both are now forced into the die D, and at the moment when the tube used comes into contact

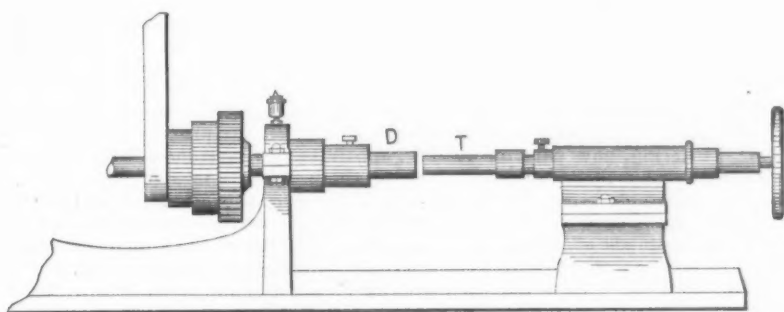


Fig. 1.

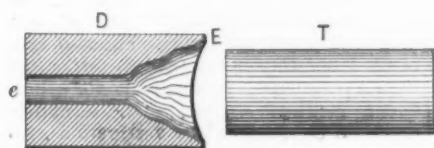


Fig. 2.

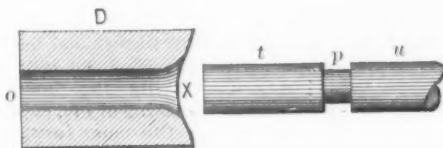


Fig. 6.

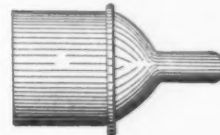


Fig. 9.

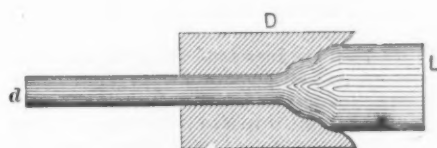


Fig. 3.

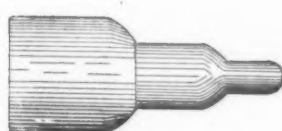


Fig. 7.

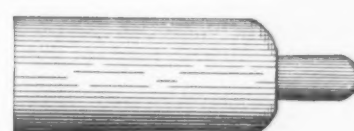


Fig. 10.

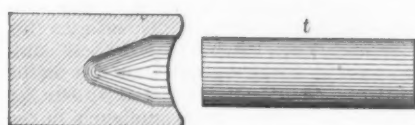


Fig. 4.

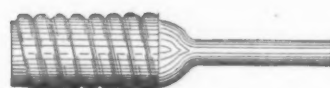


Fig. 8.



Fig. 11.

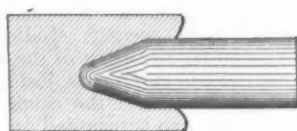


Fig. 5.



Fig. 12.

WELDING COPPER.—A REVOLUTIONARY INVENTION.

& Atwood of Waterbury. Both the methods adopted and the results obtained are certainly extraordinary, and are calculated to very largely extend the use of copper and its alloys by making possible new methods of manufacture and cheapening goods in many lines. The invention which Mortimer McRoberts is bringing forward may be classed in two groups. The first step attained by James H. Bevington, the inventor, was a very simple method of

Spinning Tubes.

It was found that if a tube was made to enter an annular die, revolved at a suffi-

diameter reduced. It is forced to enter the die by means of the tail-stock screw or lever. When the tube or rod enters the die, revolving at a high rate of speed, an intense heat, local in its character, is generated by the frictional contact, and the metal is softened. It then assumes the form prescribed by the shape of the die. Fig. 2 shows such a die, D, in section at the moment when the tube T is about to enter it, while Fig. 3 shows it during its progress through the die. A particularly important feature of this process is that it leaves practically unchanged the thickness of the metal, which is uniform through-

with the die it is reduced, and by reason of the intense heat generated by the frictional contact of the rapidly revolving die, is welded to the tube *t* and passes out of the opening *o* reduced to the same size and thickness as the tube *t*. The different forms given the tubes and rods thus subjected to the new process are shown in Figs. 7, 8, 9, 10, 11 and 12, which are only a few of the many shapes made.

It will be readily understood how wide a range of utility this extraordinary method possesses alone in the matter of reducing the size of tubes and rods to meet special requirements. Subsequent developments,

however, showed an ability to weld copper in many different forms which borders on the incredible. We have seen bundles of fine wire whose ends were welded solidly together, although hundred of wires formed the bundle. We have seen heavy copper rods welded without apparently in the least weakening the metal. Mortimer McRoberts shows samples of tubes produced by welding strips, and has even made tubes consisting of copper and brass. As yet the process is in the early stages of its development, but it shows a capacity for improvement and expansion which are sure to render it of the utmost importance in many branches of the metal trade.

The Massachusetts Institute of Technology.

At the twenty-fifth anniversary of the Massachusetts Institute of Technology, Boston, Mass., the exercises included an address by Augustus Lowell, some extracts from which may prove interesting to our readers. Among other things, he said:

An institution of learning may make a demand upon public recognition and gratitude because of its good work in training successive classes of young men for usefulness in life, even though it be not an innovation in education, and uses only the old and familiar methods of instruction; but it may acquire a further and larger claim by becoming a leader in its department, by introducing new methods, and opening the way to a better kind of intellectual and professional training.

How the Institute of Technology has dealt with the thousands of young men who have been its pupils since 1865, what it has done for them, what places they now occupy in the industrial system, what services they have rendered to the arts and industries of the country, common fame will tell. Those who study this matter more carefully will find material in the lists of its graduates and of the places they fill, as told in the annual catalogues.

But in addition to its work in training a certain number of young men for the duties of life, the Institute of Technology has been pre-eminently a leader in education. Its influence has not been confined to what it has done for its own pupils, but has extended as far as its example of advanced scientific and technical instruction has gone.

Almost at the very outset a long step forward was taken in the establishment of a laboratory of general chemistry. Up to that time general chemistry had been taught wholly by means of text books, or by lectures with experiments by the lecturer. The student's part was only to look and listen, and learn in this way what he could. It was not until the student was put into the analytical laboratory, and took the retort in his own hand, that he did or discovered anything for himself. Under the inspiration of Professor Rogers and the enterprise and administrative skill of Prof. Charles W. Eliot and Prof. Frank H. Storer, a laboratory of general chemistry was established, and the pupil from the first day of his chemical studies was set to teach himself. This was no analytical laboratory. It was simply designed as a means of illustrating, emphasizing and supplementing the instruction of the lecture room in regard to the nature of chemical action and the characteristics of the principal elements. The student was not told what he should find. He was told to do something, and note what occurred. He was thrown upon his own faculties of observation and reflection. He learned to know himself, and to measure his own power, and he acquired ease and accuracy of manipulation by practice. So far as known this was the first laboratory of such a character set up in the world. Certainly it was the

first one instituted in the United States for the instruction of considerable classes of pupils. The publication of "Eliot & Storer's Manual," designed for students taking this course, marked an epoch in the history of education.

Another equally important step in scientific education, and one of which the originality is beyond doubt, was taken at about this time in the establishment of a laboratory now known as the Rogers Laboratory of Physics. Under the inspiration of President Rogers, the scheme of a laboratory where the student of physics should be set to make observations and conduct measurements for himself, in demonstration and illustration of the physical laws taught in the lecture room, was carried out with remarkable ability on both the scientific and administrative sides by Prof. Edward C. Pickering, now director of the Harvard Observatory. So complete was Professor Pickering's study of the needs and capabilities of such a laboratory, so masterly his treatment of it, that it has required only more room and additional apparatus to allow the system he then devised and formulated to be extended successively to classes of 50, of 100, and even 150 students.

In the school year of 1871-72 another forward step in education was taken at the Institute of Technology. Down to that time the instruction in mining engineering and metallurgy had been, here as elsewhere, conducted by means of text books, lectures, drawing models and assays of small pinches of ore, supplemented, in the case of the more fortunately situated schools, by occasional visits to mines in actual operation. In the year named a scientific exposition to the Rocky Mountains was undertaken by a large party of students and instructors from the institute. While in the Colorado mining regions Professor Runkle conceived the idea of a laboratory which would add to the existing means of instruction in mining and metallurgy the practical treatment by the students of economic quantities of ores. This conception, so fully in the line of the general work of the institute, was given effect by the purchase in California, before the return of the expedition, of a number of pieces of apparatus suitable for the beginnings of such a laboratory. The apparatus thus obtained was set up by Robert H. Richards, then instructor, and now for many years professor, of mining engineering.

From these small beginnings made under Professor Richards' care it has grown steadily to this day. It was the first proper metallurgical laboratory devoted to the purposes of instruction in the world. It is under its title, "The John Cummings Laboratory," by far the largest and the best in the world to-day. Its graduates are found in the most important mines and smelting and reduction works of the United States, showing the effects of their training at the institute, in which theory and practice were so happily combined, and everything taught in the lecture room is at once put in use in experiment and research.

In 1873 a further step in technical education led to the establishing of a laboratory of steam engineering. An engine of 16 horse-power was set up, and the necessary apparatus for engine and boiler tests was provided. Out of this humble beginning has grown the largest and best equipped mechanical engineering laboratory to be found, in which not only is the work of instruction carried further than ever before, but original research, conducted jointly by the students and their instructors, is pushed to points often beyond the range of ordinary expert investigation within the profession. In the same year the Lowell Free School of Industrial Design was established at the expense of the Lowell Institute, for the purpose of

promoting the industries of the country, and especially the textile manufactures, by cultivating the American taste in respect to form and color.

In 1876 the system of shop work as a means both of general and professional training was introduced. Half an acre of shops, filled with the best tools, machines and engines, with over 200 students pursuing this branch of instruction, represent to-day the poor, mean shed, with its scanty appliances, which was all that the funds at the command of the institute allowed to be erected in 1876.

In 1881 was established a laboratory of applied mechanics, devoted especially to the tests of building materials in wood, stone and iron. The equipment of the laboratory has been increased from year to year, until it comprises a great variety of apparatus and machines, designed largely by the instructors in that department, for making almost every kind of test which the purposes of the engineer, the architect, the shipbuilder or the mill owner may require—beam tests, column tests, rope and wire tests, shafting tests, tests by tension, by transverse strain, by compression, by tensile strain, and continuous intermittent or instantaneous tests.

In 1884 the germ of a biological laboratory, which had existed in a corner of the shed used for the workshops of 1876, was developed with the aid of a large amount of physiological apparatus. The resources of the laboratory were turned, first, upon the preparation of its students for subsequent medical studies, and, secondly, upon bacteriological investigations, to which the marvellous discovery of Koch and Pasteur had pointed. It is not too much to say that there is scarcely a place in this country where as much important bacteriological work has been done during the past three years as in this laboratory of the institute.

In 1882 the increased demands upon the department of physics for the higher and more technical instruction of students looking forward to electrical practice led to the establishment of a distinct service devoted exclusively to that end, and, in connection with the new building of 1883, to the equipment of an electrical laboratory, with engine, dynamos, electric motors, and a great variety of electric testing apparatus. Notwithstanding this equipment, this course in electrical engineering, as it has been developed at the institute, could not be sustained but for the machinery and ample appliances of the engineering laboratories. The training of the electrical engineer at the Institute of Technology differs from that usually followed, in that the electrical engineer is here regarded as primarily a mechanical engineer, but a mechanical engineer who has specially studied the mechanical requirements of the electrical industries and enterprises, just as the chemical engineer under the course established two years ago is regarded in his relation to the chemical industries. And this introduces us to the last contribution made by the Institute of Technology to the philosophy of scientific and technical education, in the recognition of laboratory work in mechanics as an essential feature of a proper training in any branch of the great engineering profession. In the mechanical laboratories the students in each branch of engineering—civil, mechanical, mining, electrical, chemical and sanitary—are called to perform the work of experiment, and to deal with the generation of power, and its application to the exigencies of their several contemplated professions.

We have thus roughly traced the history of the Institute of Technology. We have seen within how few years it has grown from a doubtful experiment into one of the most important schools of the country. We have seen how largely it has enjoyed

Chord Boring Machine.

The Niles Tool Works, of Hamilton, Ohio, have recently brought out a chord boring machine, which consists of two independent heads mounted on a bed of wrought-iron "I" beams 15 inches deep. It was designed for boring bridge chords, iron beams and kindred work, with special regard to having the two spindles work together with precision, exactly parallel with each other in all positions.

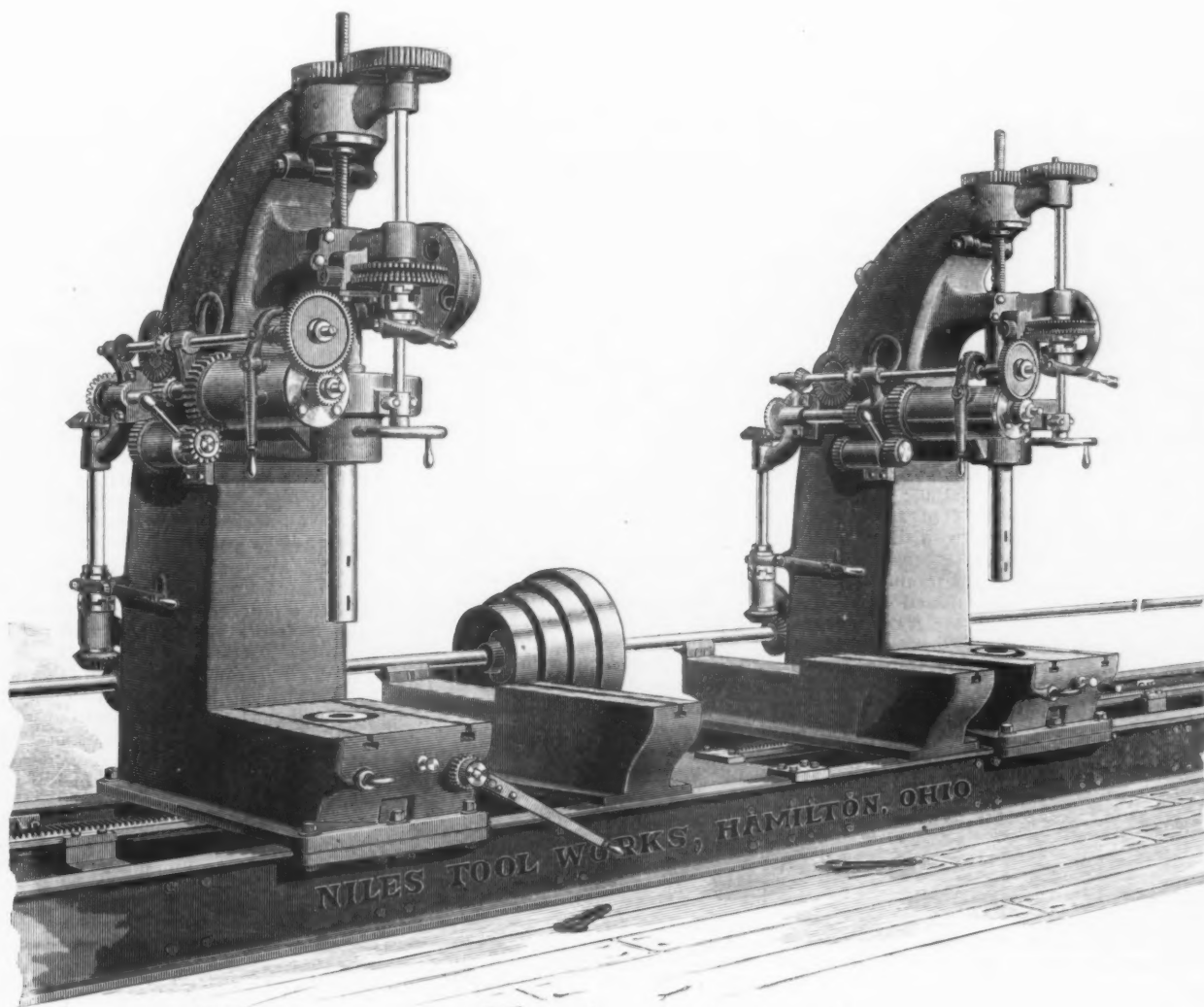
Each head is complete in itself, driven independently, and has all attachments, feeds, &c., for a complete boring machine. The power is ample for boring four holes punched 4 inches diameter to a diameter

By means of the clutch shown at the left of column the heads may be run independently or together. The driving cone and shaft are placed low down close to the bed. Power is transmitted through the two sets of bevel gears and vertical shaft shown to a horizontal shaft on which is a worm driving a worm wheel on the spindle. This method of driving by tangent gearing affords a smooth and steady motion to spindle.

The machine is strongly back geared, giving eight changes of speed to each spindle and permitting them to be run at different speeds; one may be used to drill a 1½-inch hole at the same time the other is running at a speed suitable for boring holes as

The two turreted monitors Nahant and Jason were taken into dry dock at League Island after being in fresh water 20 years and were found in good condition. The corrosion was very slight.

Advices from Harrisburgh, Pa., under date of March 4, state that the committee appointed to inquire into the causes of the Mammoth mine disaster will report that the H. C. Frick Coke Company is in no way blamable for the accident. The committee believe the test measurement of air in the courses had not been made as frequently as required, but yet abundance of fresh air existed. The explosion



CHORD BORING MACHINE.

of 8 inches at one time, and the range of speeds is such as to adapt the machine to drilling holes down to 1½ inches diameter.

The spindles are 4½ inches in diameter, and are counterbalanced by a weight hung in the column. The two columns have both power and hand movement for adjustment on the bed, and have a range of work from 5 to 50 feet between the centers. The heads are traversed rapidly by power along the bed approximately to the position desired. The final adjustment and accurate setting is made by the hand lever shown on front of the column base.

The heads have 18 inches reach, boring to the center of 36 inches, and will take in work 36 inches high under the cutter. The spindles have a traverse of 24 inches. The power feeds are reversible in both directions, having a range from 1/16 inch to 1/4 inch for heavy work and coarser feeds for light work.

large as 8 inches in diameter. By means of slip gears the number of feed changes is doubled, giving a total of six feeds with one pair of gears; by the use of additional slip gears the number of feeds is practically unlimited. The feed is engaged or disengaged by a clutch. This permits a quick movement by hand, using the hand wheel shown. Two independent carriages for supporting work on the bed are provided.

The capital of the American Projectile Company is \$500,000. Half of this amount is to be paid to the Thomson Electric Welding Company for its United States projectile patents and the exclusive use of the welding process for the manufacture of shell in this country. The remaining \$250,000 of the stock of the company will be sold at par for working capital.

was caused by a sudden rush of gas from that portion of the mine where pillars were being drawn.

Business in Chili is suspended by civil war, and the effect is liable to be disastrous, particularly with those houses having large outstanding accounts. Those, for the most part, contracted when exchange was at 22 to 24 per dollar, even if paid in full, with exchange at 17 and 18, represent a depreciation of 25 to 30 per cent. Exchange at 17 means that our gold dollar stands at one to three. President Balmaceda is determined in resisting the insurgents. Regret is expressed that he did not in due season conciliate "an opposition so formidable and eminently respectable."

An Austrian manufacturer of mother-of-pearl proposes to establish the business in the United States.

the confidence and liberality of the public, and we feel that we may securely rely upon the same generous support hereafter. We have seen how its methods of instruction have been adapted to the changes and developments of practical science. We have seen that in this mobility, this power of adaptation, lay the grand idea of the whole scheme; and we are sure that, so long as it continues to be its guiding principle, the Institute of Technology will stand—a monument to the character, learning and wisdom of its founder, worthy the community in which its establishment was possible and by which it has been maintained, an honor to the instructors who have devoted their energies to its service, and fortunate, as we trust it may long be, under the direction of so distinguished and able a president as Gen. Francis A. Walker.

The Calculation of Blast Furnace Charges.

BY GEO. C. STONE, NEWARK, N. J.

While I fully agree with Mr. Suris that it is frequently impossible for a furnaceman to make a cinder of definite composition throughout, yet I cannot agree with him in thinking that it is sufficient to merely fix the percentage of silica in the cinder, because two cinders may contain the same percentage of silica, and yet belong to different mineral species and produce quite different results. For instance, to take Mr. Suris' example, using the percentages of limestone given by his calculation, gives a ratio of acid oxygen to basic oxygen for ore A of 100 : 108, for ore B of 100 : 120, for ore C of 100 : 93, and for ore D of 100 : 78, a difference that would be apt to cause considerable variation in the grade of the product.

For my own use, I have found a cinder with an oxygen ratio of 1 : 1 the most suitable, and I use the following table, which gives the equivalent in lime calculated for that ratio, half the manganese being calculated as going to the cinder:

Table of Lime Equivalents.

	1	2	3	4	5	6	7	8	9
SiO ₂	— 1.86	3.73	5.60	7.46	9.33	11.20	13.06	14.93	16.80
Al ₂ O ₃	+ 1.65	3.30	4.94	6.59	8.24	9.88	11.53	13.18	14.82
MgO	+ 1.40	2.80	4.20	5.60	7.00	8.40	9.80	11.20	12.60
MnO	+ 0.30	0.79	1.18	1.58	1.97	2.37	2.76	3.15	3.55

Taking, for example, an ore containing:

Ore:
 SiO₂ 15.00 = — 27.93 CaO — 27.93
 Al₂O₃ 3.00 = + 4.94 CaO
 CaO 5.00 = + 5.00 CaO
 MgO 0.80 = + 1.12 CaO
 MnO 2.00 = + 0.79 CaO + 11.85

Ore = — 16.08 CaO

Limestone:
 SiO₂ 2.00 = — 3.73 CaO — 3.73
 Al₂O₃ 0.50 = + 0.82 CaO
 CaO 53.00 = + 53.00 CaO
 MgO 1.20 = + 1.68 CaO + 55.50

Limestone = + 51.77 CaO

16.08
 51.77 = 31.6 per cent. limestone necessary, giving a cinder containing 34.26 per cent. silica.

Supposing it is necessary or desirable to use instead the following limestone, we have:

SiO₂ 2.00 = — 3.73 CaO — 3.73
 Al₂O₃ 0.50 = + 0.82 CaO
 CaO 29.50 = + 29.50 CaO
 MgO 20.00 = + 28.00 CaO + 58.32

Limestone = + 54.59 CaO

The calculation for the ore being, of course, the same as before the percentage of limestone needed is $\frac{16.08}{54.59} = 27.6$, giving a cinder with 39.52 per cent. silica, but having the same oxygen ratio as the other.

A new table must, of course, be made for each variety of cinder, but it is so easily made that it saves time, when the ore mixture is complicated, even if only used once.

NEW PUBLICATIONS.

MIXED METALS OR METALLIC ALLOYS. By Arthur H. Biorns. Size, 4 $\frac{1}{2}$ x 7 inches; 384 pages. Published by Macmillan & Co. Price, \$1.50.

The author of this work is principal of the School of Metallurgy, Birmingham and Midland Institute, and has published other metallurgical books, principally designed for the use of students. With the rapid increase in the use of alloys of all sorts, especially the bronzes and aluminum compounds, there is a demand for a practical treatise that will give information upon the compounding of these mixed metals and their physical qualities. In the book before us attention has been given to a most extensive list of alloys, and instead of having to look up the composition of a mixed metal in some book of reference, the reader in this single volume is presented with a collection of all the alloys that are in common use. In the introduction to the work is an interesting, but brief, treatise upon the early history of metals; a short account of some of the important gases and reducing elements and descriptions of the properties and characteristics of the metals ordinarily met with. The chapter also includes a treatise on the nature of alloys, and makes reference to slag, fluxes, refractory materials, &c. Tables are also included, one being a list of metals with symbols, atomic weights and specific gravities. Chapter II, which covers some 80 pages of the work, is a very thorough treatise on cop-

per alloys. The extensive field covered by this and also by the next chapter, which treats of bronze alloys, need not be dwelt upon, for, as is well known, these imply a vast variety of useful compositions. Machine bronzes or brasses are next taken up, including phosphor bronze, silica bronze, manganese bronze, babbitt metal (which the author spells with one "t"), aluminum bronze, &c. The soft and precious metal alloys are next taken up. German silver is the subject of the fifth chapter; tin alloys are treated of in Chapter VI, lead alloys in Chapter VII, while in Chapter VIII consideration is given to the subject of amalgams. The next chapter treats of gold alloys, then silver alloys, then platinum alloys, and the book closes with a brief account of iron alloys and miscellaneous mixtures. Altogether, it is a very compact, interesting and valuable little treatise, and the publishers have done their part to make the work attractive and readable.

J. A. Long, an Ohioan who is engaged in making iron specialties, recently received an order from England for hot-polished shafting to go to Africa. Hot polished shafting is made by a patented

process, and the iron rods are considered more valuable than the rods made by old processes. "You must have the 100 pieces ordered perfect to the hair's breadth," said the letter, "because they are to be shipped to Zanzibar and thence go 300 to 400 miles into the interior of Africa to be fitted into machinery in the mines there."

Cheap Aluminum.

During the past few years the public has been frequently treated to the prophetic visions of fluent writers, who have dwelt upon the advent of the aluminum age. Those who have been closely connected with the development of that interesting metal have never encouraged unreasonable expectations. We have never heard one of the men who were earnestly working to extend the field of aluminum speak of the time when our rivers would be spanned by bridges built of the white and light metal.

They have never countenanced wild talk. Those who have been doing the real work have not pointed to every clay bank as the source of unlimited quantities of 10 per cent. aluminum. They have not relegated to the rear copper and tin, and their alloys, but have frankly acknowledged the limitations which are imposed, by its characteristics, upon the new industrial metal.

Many who do not well know the metal trades cling to the belief that consumption must expand enormously with every reduction in price. The history of nickel has pretty well proved that that is not the case. A metal finds new uses very slowly. A low price is unquestionably calculated to stimulate consumption very greatly, but its effect is reached only after a considerable period.

During the past few years aluminum has attracted a good deal of attention. It has been rapidly reduced in price, and has grown in favor. The last and most radical step in the direction of making the metal accessible to consumers has been taken by the Pittsburgh Reduction Company of Pittsburgh, who have reduced the price to \$1 per pound. There can be no doubt that at that figure it can be economically used for many purposes from which it was hitherto excluded.

It will find a very rapidly growing use as a component of many alloys. We expect to see it soon employed widely for iron, steel, brass and bronze castings. It does unquestionably improve their quality very materially.

There is no money in farming, according to a Western correspondent, who says: "It will doubtless be surprising to think of any considerable part of Ohio decreasing in population, yet the full census returns by counties, which have but recently been published, show that in 28 of the 88 counties of the State there are fewer people than ten years ago, and 45 counties can be named whose aggregate population is less than in 1880. The loss is almost wholly in the farming districts. There are but few towns of over 3000 people that have not gained. The counties that have lost include some of the best agricultural counties in the State. Among them are Brown and Clermont, both of which are within 60 miles of Cincinnati. The loss in the 28 counties varies from a fraction of 1 per cent. to 9 per cent. of the population in 1880. Even in counties containing thriving manufacturing cities where the farmers have that treasure dear to every protectionist's heart—the home market—there has rarely been any increase in the farming population."

Millionaire manufacturers in Montreal are said to have worked hard for the success of a conservative tariff.

THE WEEK.

Boston building inspectors report that the total power of all the steam boilers examined during the year was 72,299, the number of boilers examined being 1894, and the average horse-power being 40. It is somewhat interesting to note that some of these were built in 1852, and have been running constantly during these 39 years.

A shipment of cotton goods direct to Manchester, England, was made last week by a firm in Augusta, Ga.

Mr. Sayers, of Texas, the leader of the Democratic minority on the House Appropriations Committee, has prepared a statement which shows that the total appropriations made during the Congress just closed aggregates \$1,006,270,471, against \$817,963,859 during the preceding Congress. These amounts include the permanent annual appropriations. The total appropriations for the first session of the Fiftieth Congress were \$422,626,343, and for the second session \$395,337,516; for the first session of the Fifty-first Congress, 464,442,510, and for the second session, \$541,827,961, to which Mr. Sayers estimates that \$800,000 should be added for various small items.

Cuba will be represented at the fair in Chicago by some of its most prominent citizens, among whom is the Mayor of Havana. The planters are said to be especially anxious to secure a commercial treaty, and to have made urgent representations at Madrid to show its absolute necessity.

An influential representative of the Russian Government, now in the United States, believes that Central Asia offers great possibilities for raising the cotton plant and that with improved facilities for reaching the cotton markets of Europe, American cotton can be driven out. Aside from natural advantages arising from soil, climate and locality, labor in Central Asia costs very little. The art of cotton growing is being acquired practically on a plantation purchased by Russians in Louisiana.

The new United States naval register shows that the vessels now attached to the navy are: First rate, 5; second rate, 10; third rate, 40; fourth rate, 9; tugs, 12; sailing vessels, 12; unserviceable, 3. 19 vessels are building, including 2 gunboats, 3 tugs, 11 cruisers, a harbor-defense ram and a steel low free-board barbette turret coast defense (the Monterey), and a practical cruiser for the Naval Academy.

The survey of the contemplated international railroad will commence at a central point in Columbia, under William F. Shank of Pittsburgh as organizing engineer, three parties working in a southerly direction and two north, with the assistance of local engineers from the countries crossed. The chief difficulty will be in the Andes range of mountains.

The Knights of Labor, D. A. 49, met at the big hall of Cooper Union and after being addressed by Grand Master Workman Powderly, passed a resolution denouncing the "parasites and leeches" who at present control the Central Labor Federation.

The Brush and United States Electric Lighting companies sue New York City for upward of \$1,000,000, to reimburse losses caused by Mayer Grant's order to remove poles and wires from the streets. The city claims the right to regulate structures in the public thoroughfares.

The Cunard Company have ordered two steamships from the Clyde firm of Fairchild & Co. which will be the largest vessels of the kind afloat, being 14,000 tons each, and to run at the rate of 21 knots in

mid-Atlantic. Mr. Carnegie, who has just returned from Europe, estimates the cost of each vessel at \$2,000,000. He fully expects that before two years have gone the Atlantic will be crossed in five days.

The Governor of Guatemala has signed a contract for a ship canal 104 miles in length, which will permit steamers of 100 tons burden to enter from the Atlantic to the interior of the republic.

President Ezeta of Salvador, whose election has been ratified by Congress, says the Government has heard of the purchase of arms in the United States by Guatemala and Honduras, but does not know of any hostile intention on their part. In any case he is prepared for defense.

By the action of Congress about 8,000,000 acres of Indian lands, mostly in the vicinity of Oklahoma, are opened for settlement. The cost to the Government will be about \$9,000,000.

The bill for a new mint in Philadelphia carried no appropriation.

A third elevated railroad in Chicago has been incorporated, with \$6,000,000 capital.

At a meeting of the State Railroad Commissioners in Washington City March 4 a resolution was adopted "That it is within the power of Congress and the State legislatures to delegate the power of reasonable regulation of rates to boards of commissioners, and to make their findings upon questions of fact, after fair legal opportunity to be heard, as conclusive and binding upon the courts as the findings and acts of other administrative officers."

Germany, like Italy, seeks to economize by reducing the naval budget.

A natural gas company has leased 5000 acres in Utah.

A corporation has been organized to clean the streets of New York City with machinery.

The great Simpson dry dock at League Island, which has been in process of construction for two years, was satisfactorily tested last week, together with the steam pumps, which have a capacity of 60,000 gallons a minute. The latter were built by the Southwark Foundry Company and much exceed contract requirements. The appropriation for the dock was \$550,000.

A new Alliance movement contemplates the formation of a huge grain and live stock trust, including Nebraska, Kansas, Missouri and Iowa, modeled after the whisky trust.

The New York and Brooklyn Ferry Company intend to build a bridge across the East River themselves rather than allow the transportation business to be monopolized by rival builders.

The inventor of the metallic lifeboat, Joseph Francis, will celebrate his ninetyeth birthday, March 12, at his home in Minnesota.

A letter from Mexico speaks of the resentments caused in that country by the rejection of the Grant-Romero treaty, and the demands that have since sprung up, particularly in the Southwestern States, for reciprocity between the two countries. The writer reaches several conclusions: "1. The initiative proposals for reciprocity must come from the United States in such a way as to conciliate Mexican feeling. Advances are not to be expected from the other side. Mexico is to be approached, if at all, in so generous a spirit as to extinguish resentments created by recent complications and persistently stimulated by English, German and French diplomatic agents. Reciprocity is to be offered to Mexico as part and parcel of a broad

and enlightened scheme of continental trade, by which the United States may be brought into closer, more friendly and more harmonious relations with Brazil and Spanish America. At the same time this policy must be adapted to the economic conditions of Mexico."

The future of American shipbuilding is very hopeful, according to a correspondent in Washington, who says: "We have made such progress in shipbuilding during the few years that the Government has been building new ships that we can today build as cheaply better ships than are built on the Clyde. This fact is demonstrated at the Cramp shipyard. More than this, the stimulus from this advancement in the art of shipbuilding will cause the construction of new merchant lines. The encouragement given in the Postal Subsidy bill will lead to the establishment of a great transatlantic line, to be built with American money and conducted as an American enterprise, flying for the first time in many years the United States flag over a modern steamship line between New York and Liverpool. The plan for this new line has been completed, and the public will soon hear of it in connection with capitalists who are thoroughly experienced in this kind of enterprise and who have been reserving their energies for the time when they could have a line which should carry their country's flag."

Manufacturers in Ohio declare that if the Farmers' Alliance pass their tax bill in the Legislature it will drive them from the State.

The Department of State has been officially informed that an international exposition of machines and motors for small industries will be held under the auspices of the Royal Department of Agriculture, Industry and Commerce at Palermo during the coming spring, and that the Italian Government will be pleased to see there exhibits from American inventors and manufacturers.

Builders in New York think the spring offers dull prospects, owing to the state of the money market, recent overbuilding and the chance of labor troubles.

What constitutes a real fighting navy is told by Admiral Braine, U. S. N., in a speech before the Order of the Cincinnati, 24th inst., in which he said: "White squadrons were well enough at their advent, but it is safe to say that those ships, built by new hands and on incomplete plans, will never be duplicated. First attempts are never a full success. I am not a believer in the new gospel of runaway. I hope to see no more experimental ships for the navy. The great need of the hour is the battleship. Not the 20-knot cruiser to run from an enemy. Any navy which cannot take the sea and do battle there is no navy at all. Any navy which may be sure to fall a prey to an enemy, or which dare not go in and fight it out, constitutes as great a peril to the nation as if there were no navy at all. To invite capture or defeat may be very chivalric, but it is not a part of statesmanship." Fleet ships, he might have said, are only auxiliary, "flying squadrons," as it were.

A contract has just been closed by the Magnetic Separator Company of Watervliet, N. Y., in which Troy and Albany parties are interested, with the Hartzell mines of Rittenhouse Gap, N. J., placing an order for a machine of 150 tons capacity per day, the ore to be separated by the Ball & Norton process, using the latest improved Monarch Magnetic Separator. By this process iron is taken in its crude state, and by passing once through the machine produces a concentrate of nearly commercially pure ore, thus converting a non-Bessemer into Bessemer.

MANUFACTURING.

Iron and Steel.

The Glasgow Iron Company of Pottstown, Pa., have posted a notice of reduction of wages in the puddle department, beginning March 16, from \$3.75 to \$3.50 per ton, and of a reduction of 7 per cent. in the plate mill.

It is announced that the Bellefonte Furnace, at Bellefonte, Pa., will be thoroughly repaired at once and put in readiness for operation.

The Chattanooga Furnace at Chattanooga, Tenn., operated under lease by the Georgia Mining, Mfg. and Investment Company, has been blown out for repairs. The furnace will be idle about three months.

The Lehigh Zinc and Iron Company of Philadelphia have removed to new offices at 925 Chestnut street, that city.

The Slatington Rolling Mill Company, Slatington, Pa., started their mill up full time March 2.

The American Tube and Iron Company have completed plans for the erection of large additions to their works at Middletown, Pa. A lap mill 60 x 341 feet has been finished; also a butt mill 168 x 180 feet, and preparations are being made for the erection of another butt mill, to adjoin the one just built, the size of which will be 84 x 120 feet.

The blast furnace of the Burden Iron Company, at Troy, N. Y., which has been idle since August, blew in on the 5th inst.

The Oxford (N.J.) Iron and Nail Works have resumed operations.

It is reported that the Lone Star Iron Company, at Jefferson, Texas, have contracted with Atlanta, Texas, parties for a large quantity of ore for their new furnace.

Riverside Furnace of the Riverside Iron Works, at Benwood, W. Va., has been banked down on account of their supply of coke being exhausted. It is probable that before starting up again the furnace will be blown out for relining and other repairs. The lap weld department of the tube plant of this firm resumed operations this week.

The puddling department of the plant of the Belmont Nail Company, at Wheeling, W. Va., is idle on account of the refusal of the firm to sign the Amalgamated Association scale.

At Steubenville, Ohio, on March 6, the Miners' and Mechanics' Bank applied for an injunction to restrain the Boston Iron and Steel Company and J. R. Jackson from tearing down furnaces and machinery of the Steubenville Iron and Steel Company, at Ali-kanna and North City, preparatory to removing to McKeesport, Pa. Three furnaces have been dismantled, and the banks hold mortgages for \$12,000 and seek to stop further demolition. The court granted a restraining order.

No. 2 Furnace of the Crane Iron Company, Catsauqua, Pa., which has been idle for some time undergoing repairs, will resume operations during the present month.

Advices from Youngstown, Ohio, under date of March 6, state that the action of the Trunk Lines Association in reducing rates will not have the effect of starting up the idle blast furnaces in the Mahoning Valley, as the operators claim it is not a sufficient reduction to comply with the terms made by them in the shut-down resolution which went into effect on January 10 last.

The Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., which have been idle since February 14 undergoing repairs, resumed operations on Monday, March 9. During the shut-down extensive repairs and improvements were made, which will greatly increase the capacity of the plant. The capacity of the converting department has been increased about 70 per cent., four new 15-ton converters having been erected.

It is erroneously reported that the Joliet workmen of the Illinois Steel Company are on strike against a 30 per cent. reduction in their wages. The closing of the works on the last day of February after a month's run gave color to the impression. There is no strike, however. The company state that the wages schedule for this year had not been settled when the works started up in February to roll a stock of billets under last year's schedule. The works were shut down at the close of the month because business was not pressing, and also to await a readjustment of wages made necessary by the lower prices now ruling. It is proposed that the system of a fixed schedule shall be changed, and a sliding scale adopted. Negotia-

tions are proceeding very harmoniously, and it is expected that an agreement will soon be reached.

Soho Furnace of the Morehead-McCleane Company, at Pittsburgh, was idle from February 17 to February 23 on account of the flood which visited Pittsburgh during last month.

At present three of the nine blast furnaces of Carnegie Brothers & Co., Limited, at Braddock, Pa., are idle and undergoing repair. Of the six stacks in operation five are running on Bessemer pig iron, and one is making spiegel. The coke strike will not affect the operations of this firm for some time to come, as they have a large amount of coke on hand.

Clinton Furnace of the Clinton Iron and Steel Company, at Pittsburgh, is still idle and will not resume operations for some time to come.

The Adams Direct Process Steel Company of Virginia have been organized at Buchanan, Va., with a capital stock of \$100,000, all of which is said to have been subscribed. The following officers were named in the charter to manage the affairs of the company for the first 12 months: Jos. D. Weeks of Buchanan, Va., president; E. C. Pechin of Roanoke, Va., vice-president, and J. C. Schultz of Buchanan, Va., secretary and treasurer. The following named persons were chosen to serve as a board of directors: Ferd. Protsman of Pittsburgh, Pa.; E. Dillon of Buchanan, Va.; A. S. Buford of Richmond, Va.; E. S. Hutter of Lynchburg, Va.; J. A. Gale of Roanoke, Va.; M. H. Payne of Lynchburg, Va., and J. W. Johnston of Birmingham, Ala. The new concern propose to commence the erection of an open-hearth steel plant at an early date. At first the plant will consist of a single open-hearth steel furnace, with, however, all the appliances for erecting the second. They will also erect either a steam hammer or a blooming mill for turning out open-hearth blooms, billets and slabs. In addition to using the Adams direct process, the company have secured the right from the Steel and Iron Improvement Company of Pittsburgh to grant licenses in the State of Virginia to other parties who may desire to use this process. A license has already been granted to Howard & Sears of Eagle Rock, Va., mention of which was made in our issue of last week.

At the Upper Union Mills of Carnegie, Phipps & Co., Limited, at Pittsburgh, a new building is being erected in which the firm will manufacture girders to be used in the construction of bridges. It will be completed within the next 30 days and will greatly increase their present capacity for the manufacture of girders.

The Oil Well Supply Company, Limited, of Pittsburgh have purchased the plants of the Elba Iron Works and the Continental Tube Works, both located in that city. The former plant was operated for several years by Harry Darlington, who gave up his lease some time ago. For some months past both plants have been operated under lease by the concern that has just purchased them. The purchasers propose to make some extensive improvements at both plants. Some of the present wooden buildings will be replaced by iron ones and eventually the puddling furnaces will be increased by the erection of 15 new ones. Coal is being used direct as a fuel, but producers will be built to make coal gas. The property consists of about 12 acres and is a valuable one for manufacturing purposes. Both plants will be operated under the superintendency of F. Bissell Everson.

Furnace "A" of the Monongahela Furnace Company, at McKeesport, Pa., was banked last week because the supply of coke was exhausted. The furnace will remain banked until the coke strike is settled. As soon as this takes place stack "B," which is now in complete readiness for blast, will also start.

An unusual feat of rolling was accomplished at the works of the Reading Rolling Mill Company, Cofrode & Saylor, Reading, Pa., in rolling bars of angle iron 4 by 4 inches and $\frac{1}{2}$ inch thick. They rolled angle bars 123 feet long.

Under recent date the Coleman Shields Company of Niles, Ohio, manufacturers of pipe casing and tube iron, announce that the partnership hitherto existing between J. Morgan Coleman, Henry B. Shields and George J. Margerum, under the firm name of Coleman, Shields & Co., has been dissolved. The business of the firm will be continued at Niles, Ohio, by the Coleman Shields Company, by whom all claims against the firm will be paid. The following are the officers of the new concern: J. Morgan Coleman, president; Henry B. Shields, vice-president, and James D. Shields, secretary and treasurer.

A press dispatch from Cumberland, Md., under date of the 8th inst., says: By mutual

agreement between Eastern parties and Henry Roberts of Pittsburgh, one of the former stockholders, the sale made of the Crown and Cumberland Steel Works was set aside by the court. The sale was made last September for \$30,000, the highest bid, which Mr. Roberts said was insufficient, and for this and other reasons he protested. In giving their consent to calling the sale off, Attorney Richmond, for the purchasers, said that the long delay in confirming the sale, coupled with the tight money market, had spoiled their plans for operating the works. None of the allegations made by Mr. Roberts in his objections were considered by the court, but the sale was annulled by consent of the purchasers. A new sale will be made within the next 30 days.

In the courts at Pittsburgh, last week, an opinion was handed down in the case of the exceptions filed by Park, Brother & Co., Limited, proprietors of the Black Diamond Steel Works, in that city, to the appraisement made by James H. Lindsay of the interest of Capt. R. C. Gray, deceased, in that firm. The decision rendered sustains the appraiser. Two of the executors of the will of Captain Gray were members of the firm, and as the surviving members of the firm wished to purchase Captain Gray's interest, the court was asked to make an appraisement. The appraiser fixed the value of the interest at the time of Captain Gray's death, May 28, 1888, at \$570,660.88. The valuation was excepted to by the firm as excessive. The first question was as to the time at which the valuation should have been made. This, the judge said, was fixed by law, which provides that upon the death or insolvency of a member his representative had no claim as a partner. The appraiser, therefore, was right in fixing the value at the time of death. His reasons forming the basis of his apportionment were quoted as satisfactory by the court. They were that a piecemeal valuation was unjust. It was a valuation as a whole, having in view the trade, the business, the facilities, the good will, the trade-mark and the continuing in business that formed the basis. In conclusion the firm was directed to pay the amount of Captain Gray's interest, \$580,660.88, with interest from May 28, 1888.

The S. R. Smythe & Laughlin Company, engineers and contractors, of Pittsburgh have closed a contract with the Richmond Standard Spike and Iron Company of Richmond, Va., for two gas producers each 9 x 8 feet in size. They have also received a contract from the same firm for a heating furnace 10 x 7 feet and two gas producers 9 x 8 feet, to be placed in the rolling mill of the Iron Gate Iron and Steel Company, at Iron Gate, Va., which has been purchased by the Richmond Standard Spike and Iron Company. In addition to the above they have received an order for the construction of a malleable furnace from C. E. Rood of Lancaster, N. Y.

Application has been made for a charter for the Eureka Nut Lock Company of Pittsburgh, whose business will be the manufacture of bolts, nuts, nut locks, nut lock washers, &c. The incorporators are William H. Hays, John H. Dalzell, David E. Park, John W. Park, Charles A. Ginochio and John Laueri.

The differences between the Birmingham Rolling Mill, at Birmingham, Ala., and its employees have been satisfactorily adjusted, and the mill is running on full time with a full force. The trouble arose from the character of metal being used. The puddlers claimed that it decreased their earning power, and the company recognized the equity of the complaint.

N. S. Keay of Philadelphia, Pa., is prospecting at Chattanooga, Tenn., for the purpose of establishing a plant for manufacturing steel by the Bates process.

The Phoenix Iron Works of Cleveland, Ohio, are reported to be in negotiation with parties at Roanoke, Va., looking to the establishment of iron works in the latter place.

It is stated at Anniston, Ala., that a movement is on foot in that city looking to the consolidation of the Woodstock Iron Company's coke furnaces and the Anniston Pipe Works. These two plants are adjoining each other, and although owned by different companies, were built with a view of co-operating with one another.

Patterning after the German idea, a company has been formed at Birmingham, Ala., to collect and purify the vast volume of gas that goes to waste from the coke ovens of that city and distribute it through the place for fuel purposes.

Ohio iron manufacturers are negotiating with a view of the erection of an iron furnace and working mill at Trenton, Ga.

The affairs of the Pell City Iron and Land Company at Pell City, Ala., have been put

in the hands of an executive committee consisting of E. W. Godfrey, M. J. Wilson and John Maxwell. The new pipe works at that place are approaching completion and will soon commence work.

The Southern Rolling Mill near Avondale, Ala., owned and operated by the Birmingham Railway Supply Company, have been recently equipped with additional puddling furnaces. Among the new equipments to be shortly added is a three-high heavy muck train.

The Alabama Iron, Land and Furnace Company have been incorporated at Talladega, Ala., by J. W. McConnell, W. R. Hall, Snyder Powers and others, and will erect a 25-ton iron furnace.

Machinery.

The Omaha, Kansas City and Galveston Railway will establish machine shops at Denison, Texas, if a site for the shops is donated.

The Magnetic Machine Mfg. Company of Grand Rapids, Mich., are negotiating with a company for the removal of their motor works to Basic City, Va.

The South Anniston Nail Works, at Oxanna, Ala., were destroyed by fire recently and will be rebuilt immediately.

The Norfolk and Western Railroad Company will soon erect additional machine shops at Shenandoah, Va.

The Comanche Foundry and Machine Company have been incorporated at Comanche, Texas, for the purpose of establishing an iron foundry and machine shops.

An additional building has been recently erected to the iron foundry and machine shops of Crews & Westbrooke at Danville, Va.

The Common Sense Engine Company of Springfield, Ohio, have accepted an offer of \$25,000 and 5 acres of land for a site to remove its plant to Martinsburg, W. Va.

At York, Pa., \$30,000 has been subscribed toward building new machine shops at that place.

The A. Plamondon Mfg. Company of Chicago will erect, early in the spring, a factory for their own use. The structure will be 385 x 200 feet, two stories high, and will cost \$150,000. Pulleys, shafting, gearing, &c., will be manufactured.

The Cleveland Rolling Mill Company, Cleveland, Ohio, have placed an order with William Tod & Co. of Youngstown for a pair of blooming mill engines with cylinders 34 x 43 inches.

The main building of the Pound Mfg. Company, at Lockport, N. Y., manufacturers of dredges and boat machinery, has been burned to the ground.

Buhel Bros. of Philadelphia are erecting a foundry for the casting of brass and copper statues.

The Chesapeake and Ohio Railroad will build a foundry and machine shop valued at \$250,000, at Russell, Ky.

The George R. Ford Boiler Cleaner Company of Cleveland has been incorporated, with a capital stock of \$10,000. George R. Ford, John E. Chafer, John Becker, Fred C. Brown and John E. Chafer, Jr., being the incorporators.

At a meeting of the Board of Directors of the Leeburg Foundry and Machine Company, held last week in their offices in the Lewis Block, Pittsburgh, Pa., the following officers were elected: George Mesta, president; W. D. Rowan, secretary, and J. O. Horning, treasurer. The firm report plenty of work on hand and are operating their plant to its full capacity.

The Goulden Foundry and Machine Company of Columbus, Ga., have completed their new foundry and machine works. The buildings are substantial ones of brick. The machine shop is in the shape of an L, the short side of which is used for a warehouse and office, and is two stories high, 100 x 60 feet in dimensions. The lower story is used for heavy goods, such as cane mills, hangers and other goods manufactured by this company. The upper story is used for supplies and fittings. The long side is also two stories in height and is 150 x 40 feet in size. The machine shop is on the lower floor. In the angle over the L is a tower containing a power elevator, and there is also an iron tank 9 feet high by 10 feet in diameter for supplying water in boilers, and also for the automatic sprinklers, which are to be put in later on. The floor above the machine shop is occupied for pattern making and storage. The engine room and boiler house are near the end of the machine shops. The boiler is a 50-horse

return tubular. The blacksmith shop is a separate building, and is 60 x 40 feet in dimensions. It contains four forges of modern design. The iron foundry is also in a separate building, and is 25 x 80 feet in size. The core oven is novel and ingenious, and was designed by Superintendent P. T. Goulden. It consists of a series of square cast boxes built together and forming a flue, which is taken back and forth in the oven, thus doing away with the fire inside of the oven and its accompanying smoke.

Merwin McKaig will establish iron and steel shafting works at Martinsburg, W. Va.

W. C. Codd of Baltimore, Md., it is stated, will probably establish boiler works at Roanoke, Va.

At Milledgeville, Ga., P. W. Pooser and others are preparing to establish machine shops and operate them under the name of the Milledgeville Foundry and Machine Shops Company.

New machinery is being added to E. C. Wehrfritz's iron foundry and machine shops at Little Rock, Ark. The buildings will also be enlarged.

A good deal of new machinery has recently been added to the Alamo Iron Works at San Antonio, Texas.

The Gibson-Love Mfg. Company, at Chattanooga, Tenn., will shortly commence the erection of their new works, for which the plans are ready and the grounds marked off.

New boiler works are to be established at Chattanooga, Tenn.

An iron foundry is about to be erected soon on Treat and Webster Island, Oldtown, Maine, by Bangor parties.

The Leonard Co-operative Foundry plant, located at Taunton, Mass., has been sold to L. B. West for \$9000. The capital stock represented was \$25,000 when at par. The New England Stove Company will occupy the plant.

E. M. Cross is building a foundry in connection with his machine shop at Berlin, N. H.

Dexter, Maine, people are to form a stock company to engage in the manufacture of the new Burrill water wheel, the invention of Hiram Burrill of Sangerville.

The Hall Machine Company are to erect large shops at Deering, Maine, capable of employing from 300 to 400 men.

The Swampscott Machine Company, South Newmarket, N. H., have just completed a Fifield tram engine, and are packing it for shipment to Georgia.

The Pawtucket (R. I.) Mfg. Company, George H. Webb, superintendent, are extremely busy, and have numerous orders from England to fill. Recently they shipped to England two of their large bolt machines, and will ship another within a few days.

The new engine house of the Dwight Mfg. Company, Chicopee, Mass., is just being completed, and the engine will be put in as soon as it is finished by the Corliss Engine Company of Providence. The engine is of 1000 horse-power and of the compound class, with two cylinders. The steam will be supplied from four Corliss boilers of 250 horse-power each. The engine will be used to run four mills, and is placed between mills 6 and 7. The engine room is 48 x 90 feet, and is built of brick, with large windows in the sides and roof.

The Rhode Island Locomotive Works of Providence, R. I., have delivered the last six engines of the Union Pacific order for 71, which was placed last year. They are ten-wheel engines, with Belpaire fire box and 19 x 24 inch cylinders. The driving wheels are 5 feet 2 inches and the boilers 64 inches in diameter at the waist. Two ten-wheel engines, with 18 x 24 inch cylinders and 4 feet 6 inch wheels have also been delivered to the Boston and Maine Railroad. Two eight-wheel engines have been completed for a road in South America, which will be taken apart for shipment in a short time. They have 15 x 20 inch cylinders, 48-inch wheels, 46-inch wagon top boiler. The engines weigh 50,000 pounds in working order, and are built for a gauge of 1 meter, about 39.37 inches.

Hardware.

The King Axe Company of Cleveland, Ohio, have increased their capacity to \$100,000 and are contemplating the enlargement of their plant.

The Bellaire Stamping Company of Bellaire, Ohio, manufacturers of stamped ware and

sheet-metal specialties, are contemplating making some extensive additions to their works. These will be made with a view of considerably enlarging their present capacity, which is too small to meet the requirements of their constantly increasing trade.

A company has been formed at Round Lake, N. Y., with a capital of \$3000, for the purpose of manufacturing a patent foot-rest, to be attached to church pews, theater seats, &c.

The Hollow Cable Mfg. Company of Hornellsville, N. Y., advise us that they are much behind their orders on hollow cable clothes lines and braided fence wire. The increase in their business in the past three years has been very large, and there is a demand for their goods from all sections of the country.

W. P. Campbell, who recently purchased the Foster hardware plant, at Florence, Ala., is forming a company to place the plant in operation. The name of the new company will be the Southern Tack and Builders' Hardware Manufactory.

The Creston Horseshoe Company of Baltimore, Md., are said to be preparing to erect a plant at Max Meadows, Va. It is understood that the contract for the buildings has been awarded to the Edge Moor Iron Works of Wilmington, Del.

We are advised that the Toledo Block Works, Toledo, Ohio, are having a heavy trade on the all-wrought-iron blocks which they are putting on the market.

The Sterling Emery Wheel Company, Tiffin, Ohio, under the able management of Chas. D. Bennett, their superintendent, have succeeded in getting their new plant at the point named into successful operation, and have been operating for some two months. Now it is stated that the demand is increasing daily, and they are operating at present two kilns with six times the capacity formerly had. The company are offering a novel match safe as an advertisement of their productions, in which a small emery wheel some 3 inches in diameter plays an important role. These are distributed gratuitously to those interested.

The American Cutlery Company, 171 to 191 Mather street, Chicago, have made an important addition to their already extensive works. The new building is 110 feet long by 25 feet wide, two stories high, with a basement, and is constructed of brick, with stone trimmings and iron window guards. Isaac Hirsch, the secretary and treasurer of the company, will have his private office on the first floor, the remainder of which will be used for a display room and stock room. The entire second floor will be used as an adjunct to the silver-plating department, including buffing, burnishing and packing. The basement floor will be used for stock and for finishing and boxing. The new building extends the full length of the main building, with which it is connected on all floors by large doorways, but a heavy wall separates them, to guard against fire spreading from one to the other. The plating outfit will be entirely new, including steel tanks, and will embody the latest improvements in mechanical details and practice. The company propose to make this department the finest of the kind in the country. Numerous extensions have been made to these works in the last two years, both in factory room and equipment of machinery, yet they are unable to keep up with the growing demands upon their capacity. Some time since the company put in a new machine of their own design for making solid steel goods by a novel process, which greatly increases their production in this line. Their factory contains many other specialties in machinery which are not common among cutlery manufacturers, and still more are to be introduced this season.

The Lunkenheimer Brass Mfg. Company, Cincinnati, Ohio, announce under date of March 5 that they have purchased the entire plant and good will of the Porteous Brass Mfg. Company of that city, manufacturers of brass goods, gate valves, &c., and have removed the machinery and tools to their new addition, Nos. 11 and 13 East Eighth street, thus greatly increasing their facilities for the production of engine builders' and steam fitters' brass work, as well as their various specialties in valves, lubricators, oil cups and grease cups. They have been compelled to again enlarge their factory to enable them to supply the demand for their goods.

The Columbus Mfg. Company, Columbus, Ohio, are employing a force of 160 men and running double turn day and night. The company are producing a line of picks, mattocks, grub hoes, post-hole diggers, &c.

The Central City Knife Company, Phoenix, N. Y., advise us that they are working for the fine trade, and are making a line of several hundred numbers of the best jack knives and pearl handle goods, all from Wardlaw's steel

and forged blades, fully warranted. They have made a speciality of pearl work for a number of years, and do not make cheap goods. Seventy-five to 100 hands are employed in their factory, most of whom are skilled workmen.

Miscellaneous.

The Juniata Coke Company were organized in Pittsburgh last week. James Cochran of Dawson was elected president; John M. Bronson, secretary and treasurer, and John T. Cochran, general manager. The company have 50 coke ovens in operation and are building 250 more. The mines will be in Dunbar Township, Fayette County.

The Indianapolis (Ind.) Spring Works have decided to remove to Connerville, Ind., where a building 200 x 40 feet is being erected for them.

The drill factory of Martin & Hardsaeg, at Ottumwa, Iowa, was recently destroyed by fire, entailing a loss of \$40,000, which is covered by an insurance of \$15,000.

The partnership heretofore existing between Read, Irwin & Read, iron and steel brokers, Lewis Block, Pittsburgh, has been dissolved by the retirement of A. M. Irwin. The business will be carried on at the same location by the remaining partners, Chas. H. Read and Jas. Chas. Read, under the firm name of Chas. H. Read & Son.

The F. C. Austin Mfg. Company, Carpenter street and Carroll avenue, Chicago, have arranged matters satisfactorily with their creditors and the receiver has been discharged. The regular officers are now at the head of affairs and report an excellent condition of trade, with the works running double turn to keep up with orders for road scrapers and special machinery.

Among recently authorized corporations in Illinois are the following: Wilber Heater Company, Chicago, to manufacture hot water heating apparatus; capital stock, \$150,000; incorporators, E. S. Wilber, Morris J. Lamson and William L. Dustin. The Adjustable Metallic Lug Company, Chicago, to manufacture and sell adjustable metallic lugs and other kind of hardware specialties; capital stock, \$100,000; incorporators, E. L. Pickard, D. R. Porter, F. M. Bardwell and others. The Bushnell (McDonough County) Metal Wheel Works, to manufacture metal wheels and manufacturers' supplies; capital stock, \$30,000; incorporators, James Cole, J. B. Spicer and Solan Banfill. The Whitman Wagon Company, Chicago, for manufacturing wagons and other vehicles and securing letters patent for improvements on wagons, &c.; capital stock, \$300,000; incorporators, Plymouth G. Montgomery, H. Bitner and Charles O. Shervey. South Chicago Foundry Company, Chicago, to manufacture steel and iron; capital stock, \$50,000; incorporators, Lynden Evans, Frederick Arnd and J. A. Prescott. Globe Novelty Mfg. Company, Chicago, to manufacture and deal in patent household, store and office specialties; capital stock, \$25,000; incorporators, J. L. Kail, F. A. Huehn and J. H. Patterson. Chicago Lock and Mfg. Company, Chicago, to manufacture the Martin patent lock and do a general manufacturing business; capital stock, \$50,000; incorporators, Martin T. Coyne, Henry Reuter and Rufus H. Park. The Chicago Door Check and Spring Company, at Chicago; capital stock, \$25,000; for the manufacture of door checks and springs; incorporators, F. C. Wheeler, G. Richards and J. W. Brown. The Columbia Car Coupler Company, at Chicago; capital stock, \$300,000; for the manufacture of car couplers, railway devices and metal cross-ties; incorporators, Major McGregor, W. D. Fullerton and Marcus Hitch. American Zinc and Lead Company, Chicago, to mine, smelt and refine zinc, lead and other ores; capital stock, \$500,000; incorporators, James Murison, Bernard M. Douglas and Frank E. Baker. American Bridge Company, Chicago, to manufacture and sell wooden and metallic bridges; capital stock, \$100,000; incorporators, J. Berger, A. B. Robinson and George A. Richards. Lloyd's Power Transmitter Company, Chicago, to manufacture cement to be used in covering pulleys; capital stock, \$150,000; incorporators, C. Lloyd, J. M. Wright and J. N. Yeamans. The United States Bit and Tool Company, Chicago, to manufacture, repair and sell patented articles; capital stock, \$50,000; incorporators, Elwood C. Phillips, C. M. Greene and Ebenezer Wakely. The National Tank Car Company, Chicago, to build, lease and own tank cars and to own and operate tank stations; incorporators, W. N. A. Hall, E. G. Wood and S. K. Pittman.

A meeting of the plow manufacturers who furnish goods for the States along the Atlantic Coast was held last week in Richmond, Va.

By virtue of a mortgage for \$2740, executed on December 19, 1890, by the Rollstone Machine Company of Anniston, Ala. and the Rollstone Company of Fitchburg, Mass., the latter

company announce that on the 19th inst. they will sell for cash in the city of Anniston the property, tools and equipments. A re-organization of the Anniston company has taken place, and it is presumed that they will either relieve the mortgage between now and the date of sale, or finally bid in the property. S. B. Brewer has been elected president of the new company and W. A. Davis secretary.

The Mountain Lake Company, with a capital stock of \$1,000,000, were recently organized at Charleston, W. Va., to develop the Haupt iron tract, near New Castle, Va. A. E. Humphreys, at the head of the development at New Castle, was chosen president of this company; Robert Ballard of Cincinnati, Ohio, was elected first vice-president; J. D. Baines of Charleston, W. Va., secretary, and Frank Woodman, treasurer.

The Richmond Standard Spike and Iron Company, at Manchester, Va., intend issuing \$110,000 bonds, with the view of adding important improvements to their spike works.

It is stated that there is likelihood of a wire works plant being established at Basic City. Negotiations to that end are now pending.

A company has been organized at Mammoth Springs, Ark., for the purpose of developing mineral lands in that locality.

W. I. Mays of Chattanooga, Tenn., has recently sold to W. H. Sheppard and J. C. Stowers 500 acres of iron ore land near White Sulphur Springs, Ga., for \$2500. The new purchasers will develop the property.

The Queen City Mfg. Company are being formed at Meridian, Miss., for the purpose of manufacturing agricultural implements and other articles.

The Campbell & Zell Company of Baltimore, Md., are preparing to increase their capital stock to \$150,000 with a view of enlarging their boiler works.

The Mississippi Agricultural Mechanical College has recently established an iron foundry for the use of its students.

The Smithsonian Institute, at Washington, D. C., is inviting bids for iron work for roofing and ceiling west end of the Smithsonian Building.

The Illinois Alloy Company, 41 Portland Block, Chicago, have issued a little pamphlet descriptive of their anti-friction metals, which discusses in a very interesting manner the method of manufacturing such metals, and points out to consumers the qualities which they should aim to secure in purchasing material of this character.

F. & H. Born, Cleveland, Ohio, have been incorporated under the style of the Born Steel Range and Mfg. Company. The new company will build a factory at Galion, Ohio, and manufacture their wares both there and at Cleveland. They expect to do a largely increased business.

World's Fair Progress.

The first building of the World's Columbian Exposition was started at Jackson Park, Chicago, on the 7th inst. It is to be located at the corner of Sixty-second street and Stony Island avenue. The structure will be two stories in height, built of brick, with dimensions 43 x 93 feet, and two additional wings 22 x 22 feet each. In this building will be placed two fire-proof vaults designed for the safe keeping of the plans of all the Exposition construction, and which plans are valued at \$500,000. Constructor-General Burnham and staff will have their offices in the building. Supt. William H. Beach, building superintendent of the directory, will also be located here. The structure is to be completed within 60 days. A large force of men will be engaged on this construction, and will work eight hours per day.

Chief of Construction D. H. Burnham, having satisfied himself that the exposition buildings, as sketched by the board of architects, can be erected for the amounts severally appropriated for them, and having so reported to the Board of Directors on Friday evening, the board duly and formally authorized him to proceed to construct them as rapidly as possible. Accordingly, the sketches will be at once returned to their authors to be elaborated into working plans. As fast as this

is done, the contracts will be let and the work begun. Mr. Beman's plans for the mines and mining building will be ready in 30 days. Mr. Cobb's plans for the fisheries building, Mr. Jenney's for the horticultural building and Messrs. Adler & Sullivan's plans for the transportation building will be ready very little later. The rest may be strung along during the next 90 days. It will not be surprising if the contracts for these four buildings should all be let within the next six weeks. Mr. Burnham's assistant, Mr. Graham, will start to the East shortly, with the sketches of the Eastern architects, that he may give verbal instruction concerning details.

OBITUARY.

JONATHAN SCOVILLE.

Ex-Congressman Jonathan Scoville died at the Windsor Hotel, from scirrhus of the liver complicated with heart disease, on the 4th inst. Mr. Scoville had been ill for six months, but was able to attend to his business until Saturday night. Jonathan Scoville was born on July 14, 1830, in Salisbury, Conn. In 1850 he operated a blast furnace in Oneida County. He next built a car-wheel manufactory at Toronto, Canada, and soon afterward he founded another plant at Buffalo, which finally became the main one. His brother was affiliated with him in the business, the firm name being J. & N. C. Scoville. Five years ago the brothers formed the business into a stock company and held two-thirds of the stock. Mr. Scoville was elected to Congress in 1881 from the Erie district, to fill the vacancy caused by the resignation of R. V. Pierce. He was also elected to the XLVIIth Congress. He was elected Mayor of Buffalo in 1884. He was an officer and stockholder in the Buffalo Cast-Iron Pipe Company, and for several years was a director of the Buffalo, New York and Philadelphia Railroad Company, and aided largely in its construction.

COL. ROBERT CRANE.

Col. Robert Crane, a well-known railroad financier, president of the Delaware River and Lancaster Railroad, now in course of construction, and founder of the Penn Iron Works, at Reading, Pa., has died at Philadelphia at the age of 73 years.

WILLIAM F. POTTS.

William F. Potts of W. F. Potts, Son & Co., died in Philadelphia a few days ago, aged 77. He was born in that city March 20, 1814, his father being William L. Potts, an iron merchant. In 1832 he entered his father's store, and in 1835 he set up in business for himself on Market street. His house is one of the leading ones in the wholesale iron and tin-plate business, and for about a half century has been at its present location. Since 1869 he has not been actively engaged in the business of the house of W. F. Potts, Son & Co., his son, Charles W. Potts, being the active head of the firm.

H. S. Pickands of Pickands, Brown & Co., Chicago, is making a trip in the tropics. He left Chicago on February 14 for New York, thence departed by steamer for Havana, and from there sailed for Vera Cruz, Mexico. He will spend some time in the City of Mexico and will return home by way of the Mexican Central next week.

Beginning on April 15, the Post Office departments of Germany and the United States will each assign expert clerks to travel on the mail steamers between New York and Bremen and New York and Hamburg, so as to make the distribution of the mail *en route*.

The Iron Age

New York, Thursday, March 12, 1891.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Western Building Activity.

If threatened labor troubles in the building trades do not interfere, the coming season will be one of remarkable activity in the erection of new buildings in the West. From large and small cities alike the reports of contemplated operations in this line are most encouraging. In Chicago the building permits issued for the first two months of this year show an increase of about 33½ per cent. as compared with last year. These permits cover all kinds of structures, principally dwellings and flats, but include a good number of large office buildings and hotels, theaters and manufacturing establishments. The activity in the construction of dwellings follows the unusually heavy movement in real estate last year, and people of moderate incomes are now building homes largely by the aid of building associations. The movement of such people toward the improvement of real estate is expected to assume proportions far in excess of any previous year. It is a direct result of the prosperous times that Chicago workmen have enjoyed for some years. They have been steadily employed and have received good wages, and those who are at all inclined to be thrifty are providing themselves with genuine homes.

The improvement of office buildings goes on with remarkable steadiness. Almost every week now develops a new scheme for the erection of a "sky scraper" to take the place of buildings which would seem worthy of retention in many other cities. New hotels of large size are projected, partly to anticipate the rush of visitors to the World's Fair in 1893, but also to accommodate the constantly increasing tide of transients. The factories to be erected this year will not be an insignificant part of the new structures. Foundations for this purpose are already to be seen scattered through the outlying districts, while nearby towns are to be well favored, as shown by current news items.

The iron, steel and hardware trades will derive much benefit from this condition of affairs. Structural material is already in active demand from small builders and contractors. Contracts will speedily be placed for a good number of the larger buildings, and the capacity of the structural works available for the requirements of the West will be drawn upon heavily. Later in the year the World's Fair buildings at Chicago will undoubtedly be put under construction, and the structural mills will then be taxed to supply material on time. Very little is known as yet

about the exact size and character of these buildings, but the plans as far as formulated are so much in advance of previous international exposition achievements that the consumption of iron and steel in construction will unquestionably be heavy. Not only are the exposition buildings to be considered in this connection, but also the various State and special buildings which are to form a conspicuous feature of the occasion. Directly and indirectly the Chicago World's Fair may be expected to exert a weighty influence on the iron trade for the next two years.

In view of this pleasing prospect it is especially vexatious that any strikes are threatened in the building trades. It will be unfortunate indeed if this trouble cannot be averted in some way before the building season fairly opens. The good sense of the great majority of employers and employed should constrain them to adjust their differences amicably. Chicago particularly has been the scene of so many bitter conflicts between workmen and their employers which have resulted in great loss to both and no appreciable benefit to either that the lesson of the futility of strikes and lockouts should by this time have been well learned. Labor troubles in the building trades affect so many occupations and so many workers in other lines that they seem to be in the nature of a public calamity which should be dealt with by the public authorities. If there is any one branch of industry in which compulsory arbitration could and should be enforced it is clearly in the building trades.

The Biggest Trust of the Times.

Human nature is the same everywhere. All of us are instinctively opposed to combinations or trusts that we are not in. One set of manufacturers operating under close agreements with one another will be bitterly hostile to the formation of such a movement among a different set who supply them with essential materials. The late harvesting-machine consolidation was an illustration of this fact, when the managers stated that they would be able after consolidating to more successfully fight the binding-twine trust. It may be quite safely assumed, indeed, that producers generally are, on the one hand, quite willing and often very anxious to make as tight a combination as possible on what they have to sell, while, on the other hand, they would joyfully assist in destroying every combination among producers of what they are obliged to purchase.

The people who have hitherto been the most vehement opponents of trusts and combinations are the farmers. Wherever they have been able to control legislation they have secured State enactments of the most stringent character against trusts, particularly those organized by manufacturers. Their organs have denounced combinations as organizations of thieves and robbers, bent on plundering the public. And yet these very farmers, whose heart strings have been wrung by the terrible spectacle of manufacturers combining so

as to be able to get some profit out of their business, probably after consecutive years of losses, are now enthusiastically falling into line in support of a combination which proposes to control their products and enable them to get a profit. The Alliance Trust, as outlined in the Western papers, is of huge proportions, overshadowing in its magnitude everything of the kind hitherto attempted. The grain and live stock of four great States, and probably more, will, if this trust gets into working order, be held for profitable prices, and will not be sold as heretofore at current market rates, governed solely by the supply and demand. Boards of trade and exchanges of all kinds are to be driven out of existence when farmers' agents get to selling direct to merchants and consumers in the prominent business centers of the country. Every farmer belonging to the alliance will permit his operations to be guided solely by the officials of the trust, and presumably at no time will the markets of the country become glutted with corn or wheat or beef or pork.

The scheme seems too vast to be successfully accomplished or even put into anything like working order, although its originator is credited with unusual gifts in the direction of organization. Should it be successful, however, in but a limited degree, it may be expected that anti-trust legislation will become a dead letter. Such legislation owes its origin to the agriculturists, and it would be the irony of events to have them kill it because it interferes with their own plans. To be consistent they must now acknowledge that they were mistaken with regard to trusts, and that after all combinations are good things for those lucky enough to be in them.

An Iron-Ore Canard.

Quite a sensational announcement appeared in the daily papers the past week with reference to the iron-ore trade. It was quite positively stated that the Illinois Steel Company had contracted for 1,000,000 tons of Bessemer ore for this season's delivery. Some of the reports even went so far as to name the mines from which the purchase had been made. This looked like a hopeful sign of the condition of the markets, and apparently pointed to such an improvement in trade that we have made special inquiry as to the facts. We are assured on unquestioned authority that the Illinois Steel Company have not bought a pound of Bessemer ore, and apparently have no intention to do so in the present condition of trade. With two furnaces out of blast at North Chicago, three out at Joliet, one of the old furnaces out at South Chicago and the four new ones there not in operation, and, to crown all, a good supply of ores on the various docks of the company, they seem to be under no immediate necessity to enter the market.

It seems cruel to spoil such a good story as that of this gigantic sale, but as it might have the effect of misleading ore consumers in other sections of the coun-

try, the truth cannot follow too quickly on the heels of the false report. The large consumers of ore are likely this year to follow rather than to lead the procession in making contracts, and thus setting prices for the season.

The Dilemma in Canada.

Canada has spoken upon the subject of her commercial relations with the United States, in response to the demand of Premier Macdonald for a new Parliament. As an active politician he thought it advisable to precipitate the question at once, rather than wait for the general election in natural course. He remains in power, but with such indubitable signs of disaffection in the Conservative ranks that he is barely sustained as a representative of the true sentiment of the country. The latest revised returns of the elections of the 5th inst. show the result to be—Conservative 117, Liberals 93, leaving a majority for the Government of only 24. Commenting on the election the *Empire*, Government organ, says: "The issue was momentous. By calling in foreign aid the Opposition leaders lent themselves to a disgraceful attempt to subvert the independence of Canada and to overturn British rule on this continent." But "British rule" is not overturned.

By an appeal to the loyalty of British subjects the dire consequences here plainly hinted at have been at least temporarily averted; there cannot be full reciprocal trade with the United States under the new régime, and consequently the grim specter of annexation lately conjured up is supposed to have vanished. The Conservative party have vindicated the sagacity of their leader. He was fully cognizant of the growth of the sentiment demanding a reciprocal exchange of products across the boundary line, and this truth is made still more apparent by the clean sweep by the Liberals of the border counties of Western Ontario. By delaying a decision upon the future policy of the Government the rampant heresy was liable to become more widely diffused, and the danger of a political somersault which might leave the manufacturers of Canada without protection and perhaps in the end rupture the empire was all the more threatening because of the probability of a new suffrage law to be enacted by Parliament in April, greatly extending the elective franchise. Herein lay the potential argument in favor of speedy action, rather than on account of a supposed propitious time for negotiations at Washington. "The Administration," according to Secretary Blaine, if reports are correct, were utterly indifferent to the result. In this regard it may appear that a large minority of the voters in the Dominion may have indulged delusive hopes. At the same time it must be conceded that hotheads of an irrepressible character exist on either side of the line, like ex-Congressman Butterworth of Ohio, who declares that "we will either secure a larger freedom of trade or we will come upon troublous times in the attempt." Canada, we may safely assume, is compe-

tent to regulate the "national policy" without volunteer aid from the Republic. It is true, however, that the people of the Dominion find themselves confronted by stern and unwelcome facts. The sudden deprivation of a market for some of their most important products, through the operation of the McKinley tariff, has produced a feeling in some quarters bordering on desperation. Farmers are reported to be approaching bankruptcy, and country merchants are oppressed with slow accounts. For the same reason bank officers are restive under extended credits and are unable longer to expand their loans to needy customers. Thus a state of monetary stringency is brought about at variance with a lavish subsidy system and continued heavy taxation, in which the Government has been prone to indulge. Whatever tariff changes may ensue under a changed administration, prospects in Canada are not roseate.

Correspondence.

Business in Denver.

To the Editor:

The following item from your issue of February 19 is calculated to produce a wrong impression in the minds of your readers, and must have emanated from a superficial observer. "Denver, Col., is suffering from severe business depression, affecting its building enterprises and trade movements."

The "severe business depression" in Denver is not apparent to the business man here. The winter has been unusually cold, and, as a consequence, outside work has been curtailed, but, with the approach of milder weather, active operations of all kinds are resuming, and the amount of buildings projected is very great and of a better average class than for any previous year. Like all large centers of industry, Denver felt the tightness of the money market in January, but no failures of importance occurred, and the banks proved to be sound and solid, and were not obliged to resort to certificates or to any other artificial means of mutual support. Our own business is largely with builders and contractors, and since January 1 has been a trifle larger than for the same period last year.

We know a prominent dry goods house here whose sales were one-third larger in January of this year than 1890. Public improvements on a large scale are under contract; new manufacturing enterprises are commencing; the winter has been favorable to the agricultural interests, which are yearly increasing in value and importance, and the general outlook for 1891 is very good for a sound, healthy and rapidly developing business in Denver and throughout the State of Colorado.

FRANK A. ELLIS & SON.

DENVER, COL., March 3, 1891.

Town Building and Iron Manufacturing.

To the Editor: We have received within the last few years a great many pressing invitations from the South and Northwest to remove our works to or build branch works at such localities as were designated. We have not been able to make up our minds that we could better our condition by accepting these invitations. It strikes us as though the booming of those particular sections in the building of furnaces, rolling mills, pipe foundries, nail mills, &c., has been done very largely beyond the needs of the immediate, if not distant, future of those districts, and probably for the country at large.

The fact that people from the North should have gone South to build furnaces that have paid very small, if any, dividends, and thereby broken down and demoralized the pig-iron trade in the North, does not strike us favorably, and we have no sympathy for many of the people who have already lost large fortunes in that direction; neither do we think we could improve our condition, as cast-iron pipe manufacturers, in the South, where the pipe foundries have been springing up like mushrooms within the last four or five years, and when the largest and best equipped of them—the Anniston Pipe Works—is in the hands of a receiver.

It is not a very pleasant thought for pipe men in the North when pipe works, lately erected at Bessemer, Ala., take a contract for the furnishing of cast-iron pipe to Minneapolis, Minn., the only remaining territory North of any extent not provided with one or more pipe foundries. The same works have taken the contract for the furnishing of pipe for Baltimore, Md., this season, and were lately an even bidder for pipe at Erie, Pa., with the Lake Shore Pipe Foundry of Cleveland, Ohio.

While this condition alarms and paralyzes to a considerable extent the pipe industry in the North, it does not, to our mind, demonstrate the fact that the South is the place to which we should remove the remainder of our foundries. We say this because we recently converted one of our pipe foundries, built in 1876, and splendidly equipped for its purpose, into a general foundry, which furnishes the best evidence of the unprofitable condition of the cast-iron pipe trade, and that the demand in this line of trade will have to increase largely in the future or that more of the pipe foundries will have to be turned into other industries or remain idle.

Truly yours,

P. D. WANNER, Chairman,
Mellert Foundry and Machine Company.
READING, PA., March 3, 1891.

PERSONAL.

B. Frank Conner has been appointed superintendent of the Chestnut Hill Furnace at Columbia, Pa.

Frank Baird has severed his connection with the American Scotch Iron Company at Syracuse. Frank Warren is now in charge of the furnaces.

Andrew Carnegie has returned from Europe.

P. Crowshay of London, England, owner of the celebrated Cyfartha Steel Works, Glamorganshire, visited Middlesborough, Ky., March 2, inspecting the various industries.

M. Lewinson and George A. Just have entered into partnership as Lewinson & Just, as consulting and contracting engineers, with an office at 90 Nassau street, New York. They will make a specialty of executing and designing iron work for buildings and bridge and roof trusses.

Hon. B. F. Jones, senior member of the firm of Jones & Laughlins, Limited, proprietors of the American Iron and Steel Works, at Pittsburgh, has gone to Florida on an extended visit for the benefit of his health.

A notable banquet will be tendered at Chattanooga, Tenn., on the 12th inst., to celebrate the making of basic steel from low-grade Southern iron. A large number of prominent guests have been invited, representing governors, prominent iron masters and well-known statesmen. A feature of the banquet will be that one of the courses will be served on dishes made from American tin plate.

ANDREW CARNEGIE'S VIEWS.

An Interview with the Great Steel Manufacturer.

Yesterday a representative of *The Iron Age* called upon Andrew Carnegie, who returned last week from a short trip to Europe, the long and dangerous illness of Mrs. Carnegie, who is now very rapidly recovering, having made it necessary to strengthen his own health. Mr. Carnegie has all the animation and mental and physical activity which his friends have long learned to admire in him. Mr. Carnegie, as he puts it, has ceased to be an active member of the great firms with which he is connected, but is now a "consulting" member. That he does, however, closely study the situation will be evident from the views expressed in the following interview. We may even add that absence of care concerning minor details enables Mr. Carnegie to grasp the situation with better judgment.

An Interesting Interview.

"Mr. Carnegie, *The Iron Age* would like to have you answer some questions upon the general situation in iron and steel. What do you think of the situation?"

"Well, there is nothing peculiar about it. The iron trade, as you know, is the jumping jack of business, the king or the pauper. The production and consumption of iron and steel last year were phenomenal. We are a great country, but even the republic is not able to consume ten net millions of pig iron per year. My forecast was that the extraordinary consumption would continue until the coming fall. Everything seemed promising, but two causes intervened—first, shortage of crops, and, second, foreign financial troubles—and a halt was suddenly called, which otherwise, I believe, would have been postponed; but had it been postponed it would have been much more serious. We shall recover from it sooner than expected. Good crops next year may set us all right again, provided matters do not grow worse in Britain, which, I must say, are very unpromising at the present."

"If concessions were made in raw material and the cost of production were reduced by lower freights, is not that in itself an indication that prices might be reached even lower than they are now?"

"Yes, certainly; we have not yet reached bottom prices, in my opinion."

"That holds good of raw material, Mr. Carnegie?"

"Yes. Beginning with the raw material, prices were unduly inflated for ore last year, because some of us believed—and I was one of them—that it was impossible for this country to produce enough Bessemer ore, and also to furnish the amount of iron and steel that it seems probable this country would want, inasmuch as Europe was fully occupied with its own demands and those of the world. For the first time in the history of America the question had to be solved, Can the United States furnish all that would be required in iron and steel during a busy period? I did not think it would be able to do so last year."

"Was there not last year a tremendous general demand, upon which there did not come any additional and exceptional demand for railroad material? That is to say, the demand for rails was only normal?"

"The demand for rails was normal; slightly more so. I do not believe this country will take as many rails as it did last year, upon an average, for a few years to come. There was a slight excess in the

demand for rails, and an enormous demand for everything else."

"To what extent will it be possible to enlarge the demand for our home ore in the East, and in that way meet foreign ore? Will not the domestic be relatively cheaper than the foreign ore?"

"I do not think it will be found much greater than it was last year. You must remember that depression has come in Europe; not to the full extent which will be reached, but prices are steadily going down, ore will fall with it, transportation rates be reduced, and I think foreign ore will hold its own in the East this year."

"What prices do you think we will reach for ore?"

"Well, I see that they are talking of \$1 a ton less than last year's prices. This would bring them down to the prices of the year before. But I think in every depression a lower point is reached than in a previous one, because of improved methods of mining, and certainly very much cheaper transportation on the lakes. So that as far as we are concerned, we would not be willing to contract for ore at the prices of 1889: I believe that prices will fall lower, just as I say that prices for billets and plates and miscellaneous articles will fall a shade lower than they were in 1889."

THE OUTLOOK IN COKE.

"Mr. Carnegie, what is the outlook in coke?"

"The coke business is a thing by itself. For years coke was sold for less than cost. It is a curious business, as long as poor operators can get enough of cash for their coke to pay their labor, they will sell rather than blow out ovens. They take no account of the coal and the fact that they are exhausting it, none of the total loss of plant which comes when the coal is exhausted; they are like drowning men, and will sacrifice everything to keep afloat for the time. This state of affairs rendered the coke business ruinous."

"Mr. Carnegie, do you think the prices at which coke has sold for in the past any criterion as to what it may sell for in the future?"

"Very far from being a criterion. No business will be conducted very long that does not yield a fair profit. Now, it was a matter of life or death with us either to get the coke business on a better basis or to continue sacrificing our property until we had driven out the others, and so far had losses gone that we were able to purchase many of the properties of our competitors. Instead of continuing the ruinous policy, we have tried to reap a profit from the business, but the community has been spoiled by getting Connellsville coke at prices lower than it could be made. The value of coal lands has more than trebled in recent years. Coal that we formerly had for \$100 an acre now we have to pay \$500 for. Labor has risen, and at present prices of coke the concern that makes a fair margin is doing very well. For my part, I should vote rather to let our coal remain in the ground than to sell it under the present prices."

FREIGHT RATES.

"To what extent, Mr. Carnegie, have the railroads shown a disposition to meet the exigencies of the case at the present time?"

"Well, I think the present ore rate from the Lakes to Pittsburgh is a fair one. It is not as low as competition has forced the rate from the Lakes to Chicago; but I am bound to say from my own experience that it is a fair rate and that we are not justified in asking the railroads to go lower."

"How about coke rates, Mr. Carnegie?"

"Well, the Pennsylvania Railroad people heretofore considered coke a plum and have exacted rates for its transportation

which bear no relation to rates upon other things. They have discriminated against Western Pennsylvania, their own home traffic. If the Pennsylvania Railroad takes a train of our own cars from our own mines to Pittsburgh and places them upon our own sidings, it charges to Pittsburgh 72 cents. The cars are not theirs; all they have to do is to put the engine to the cars and haul them to Pittsburgh. If this is coke for Pennsylvania manufacturers it is charged 72 cents a ton. They will take the same train of cars, haul it to Pittsburgh in the same manner, and if it is destined to other States they will charge only 52 cents a ton. It is a mistaken policy, embitters everybody who knows about it, and in the interest of the railroads it should no longer be. I am in hopes that the present severe trials that Western Pennsylvania is undergoing, especially the Shenango and Mahoning valleys, will lead railroad officials to consider this question and place coke upon a fair basis. I am sure that it would be to the mutual advantage of the railroads and manufacturers, and would remove the last serious cause of hostility and feeling of antagonism between the two, which should not exist. The rate to Pittsburgh on coke should be the same as it is upon coke destined beyond Pittsburgh—52 cents per ton; the rates to the valley 1 cent per ton per mile more."

"What will the outcome be of any prolongation of the coke strike which is now on, Mr. Carnegie?"

"Well, you know that I have retired from giving attention to business. I have not thought of business for some months, and do not intend to think much about it hereafter. I do not know the particulars of the coke dispute. All I do know is, that it is the wrong time for labor to choose for making a demand for higher wages, to increase the cost of an article which we have great difficulty to dispose of at very greatly reduced rates. Leaders of labor do not seem to possess good sense in choosing their battle field and the time for a struggle with their employers. This is no time to increase the cost of anything. Men will learn that I was right when I said that labor will never get its fair proportion of profits except by a fair sliding scale—that is the true plan. When prices go up labor should participate in the advance; when prices decline it should bear its share in the decline. In this way labor and capital are not enemies, but allies, standing shoulder to shoulder through good and bad times. I know that a sliding scale at Edgar Thomson and Homestead has cost our firm a good deal more money than it would have had to pay without the sliding scale; but if we get less profit, we are fully repaid in the greater satisfaction we have in feeling that our men and ourselves are in the same boat, pulling together."

THE SOFT-STEEL TRADE.

"What is the very considerable difference between the selling prices of rails and soft steel due to—or, rather, why is apparently the soft-steel trade in so far much worse a condition than the rail trade?"

"One reason is that no concern runs upon billets as the one article from which they derive profits. Concerns make 100 different things from their steel; not being able to sell all the steel they can make, it is better for them to run their Bessemer works to full capacity, which cheapens product, and sell part of their product in the shape of billets. Besides, rails cannot be made nearly as cheap as billets, in which there is no inspection, or drilling, or finishing."

THE POSITION OF LABOR.

"We have a telegram this morning, Mr. Carnegie, that the men of the Allegheny mill will not strike

"Now, I am not attending to business at all; have nothing to do with it, but I know when I was consulted about buying the Allegheny works it seemed that we should have to close them, and I was very sorry to think that our firm should ever buy a works and have to throw men out of work, even if we had to run it without a cent of profit, although it is almost sure that if we had not bought the works they would have stopped. I was delighted when my partners told me that they were going into the market to take billets at any price to give the men work. Whenever the men want to stop the works the firm won't be sorry. Any time they should so decide we should be only too glad. Making billets at the price we have had to is not as good for the firm as to sell the pig at present prices. Besides this, I hear that the men at Allegheny are making high wages, owing to the great product. This is a splendid opportunity just to let the men have their own way in running works or stopping them. We pay the money and they take their choice. But I should like to say this to workingmen: 'Gentlemen, this is no time to quarrel with your employers. Take the best you can get, be quiet and thankful that you are not idle.'"

"When is Edgar Thomson to start?"

"Well, really I do not know what Mr. Frick has decided. I understood when he was here that we had no orders. Repairs are complete and we could start to-morrow, but there are no orders in the market. If we do not start until July we could make all the rails we shall get this year."

"Homestead, as I understand it, Mr. Carnegie, has facilities for making 17-inch armor plates."

"We have no doubt of it. I think they go to 20 inches. We have the most powerful rolling mill in the world, and our hydraulic press is being put up. It has arrived and is now being erected."

"Who is the press made by, Mr. Carnegie?"

"Davey & Co. of Sheffield. We expect to make the best armor in the world, of course."

THE SITUATION ABROAD.

"When you were abroad, Mr. Carnegie, what did you find?"

"The situation is very much as it exists here and the cause is the same. The world is so closely interwoven one part with another that nothing very serious can happen in Europe which cannot affect us here, and *vice versa*. The financial trouble which culminated in the Baring disaster is not yet healed. The load has been taken upon the shoulders of the leading financial houses, but it remains there. You see from the morning papers that several other houses are in trouble, and even that one of the guarantors of the Baring deficiency shows signs of wavering. If one withdraws the heavy load may affect the others. It is a very serious situation. Even if it is all quietly settled without an explosion, we cannot look for further railway extensions in any of the Southern American States for a good while to come. The loss of this market to Great Britain will depress prices, and already you see quotations lower and lower. This in its turn will affect our market, not so much from direct importation of iron and steel as from financial causes. Few new bonds can be disposed of, and therefore our railway extensions for this year will be very small. We are in for a quiet time. The iron and steel manufacturers of America may safely regard this as an 'off year.' Those who come out whole can celebrate Christmas with thanksgiving."

Pig Production at a Low Ebb.

A Decline of 33,000 Tons Weekly Since January 1.

The production of pig iron has not been so small for a very long period. The closing down of the furnaces in the valleys and the coke strike in the West, and the general depression in the iron and steel trades throughout the country, are having a telling effect. It is surprising that the markets have not been more seriously influenced than they have thus far, and it is difficult to escape the conclusion that consumption must really have fallen off very much indeed.

It is appalling to contemplate what a demoralization would have followed had our furnaces kept turning out iron at the rate at which they were producing early in the winter. To a great extent, of course, the action of the manufacturers of the two valleys lessened the immediate effect of the coke strike, so that thus far only a few furnaces have blown out or banked as the direct result of that struggle. But every week diminishes the supply of fuel heavily, and the effect must become more pronounced. That it is likely to be temporary in any case, leading authorities in the trade generally admit. But it is accomplishing much good in preserving the trade from what would otherwise have probably been a severe and prolonged crisis.

The weekly product of all the furnaces on February 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
March 1.....	27	134,526
February 1.....	294	146,050
January 1, 1891.....	302	167,500
December 1, 1890.....	340	183,846
November 1.....	342	177,958
October 1.....	336	179,263
September 1.....	323	171,776
August 1.....	324	164,798
July 1.....	336	175,727
June 1.....	345	180,791
May 1.....	344	180,090
April 1.....	344	178,474
March 1.....	343	180,901
February 1.....	334	173,651
January 1.....	333	174,038
December 1, 1890.....	328	169,151
November 1.....	323	165,225
October 1.....	311	151,057
September 1.....	294	134,068
August 1.....	286	145,899
July 1.....	285	141,419

On the 1st of the current month the following furnace capacity was producing:

Anthracite Furnaces, March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	19	6	2,125	13	4,213
New Jersey.....	12	6	2,732	6	2,053
Spiegel.....	3	3	193	0	0
Pennsylvania:					
Lehigh Valley.....	47	26	10,376	21	7,910
Spiegel.....	1	1	76	0	0
Schuylkill Valley.....	30	19	8,435	11	2,594
U. S. Susquehanna Valley.....	19	10	3,394	9	1,535
L. S. Susquehanna Valley.....	17	9	3,950	8	2,762
Lebanon Valley.....	16	13	7,200	3	710
Totals.....	164	93	38,543	71	21,717

For the past 18 months our records show the following:

	Furnaces in blast.	Capacity per week.
March 1, 1891.....	93	38,543
February 1.....	95	40,212
January 1.....	101	43,166
December 1.....	105	43,474
November 1.....	104	42,141
October 1.....	100	38,627
September 1.....	104	39,115
August 1.....	106	41,013
July 1.....	112	49,543

June 1.....	117	45,142
May 1.....	123	46,913
April 1.....	119	46,116
March 1.....	115	45,790
February 1.....	107	43,905
January 1.....	105	42,857
December 1, 1890.....	100	40,053
November 1.....	96	40,603
October 1.....	94	36,558

In New Jersey, Secaucus and Pequest furnaces will soon blow out. In the Lehigh Valley the plant of the Lehigh Iron Company is now idle, and the Crane Company are now running C furnace alone. Its best weekly record lately has been 755 tons. Edge Hill, in the Schuylkill Valley, has just blown in, while in the Upper and Lower Susquehanna and in the Lebanon valleys practically no change has taken place.

Coke Furnaces May 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	6	4	3,959	2	1,750
Pennsylvania:					
Pittsburgh district.....	25	17	23,899	8	11,600
Spiegel.....	1	1	507	0	0
Shenango Valley.....	19	3	2,285	16	11,178
Junata and Conemaugh Valley.....	19	8	3,750	11	4,590
Spiegel.....	1	0	0	1	400
Youghiogheny Valley.....	5	1	1,000	4	1,664
Miscellaneous.....	4	0	0	4	2,288
Maryland.....	3	1	1,820	2	3,830
West Virginia.....	5	0	0	5	3,098
Ohio:					
Mahoning Valley.....	15	3	2,218	12	9,576
Central and Northern.....	17	11	9,301	6	3,900
Hocking Valley.....	14	3	753	11	3,022
Hanging Rock.....	13	9	2,178	0	1,528
Indiana.....	2	1	246	1	115
Illinois.....	13	7	7,495	6	6,640
Spiegel.....	1	1	770	0	0
Wisconsin.....	4	3	2,425	1	570
Missouri.....	6	0	0	6	3,340
Colorado.....	2	1	630	1	500
The South:					
Virginia.....	14	7	3,878	7	2,920
Kentucky.....	4	3	870	1	310
Alabama.....	37	19	12,442	18	10,675
Tennessee.....	11	8	4,178	3	1,440
Georgia.....	2	1	259	1	494
North Carolina.....	1	1	125	0	0
Totals.....	247	113	85,093	132	80,028

As compared with previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
March 1.....	113	85,093
February 1.....	123	94,473
January 1, 1891.....	143	112,153
December 1.....	168	127,634
November 1.....	168	122,555
October 1.....	170	127,247
September 1.....	156	119,757
August 1.....	150	113,040
July 1.....	153	120,673
June 1.....	167	123,340
May 1.....	169	122,489
April 1.....	173	121,560
March 1.....	169	122,595
February 1.....	169	118,568
January 1, 1890.....	169	119,396
December 1.....	162	116,319
November 1.....	162	112,289
October 1.....	164	102,454
September 1.....	141	96,744

New York has added to its current capacity through the blowing in of a second Troy furnace. In the Pittsburgh district three Edgar Thomson furnaces were idle on March 1, and one Schoenberger was blown out during February. In the Shenango Valley, Rosena was banked, leaving only Etna, Raney and Berger and one Stewart in blast. In West Virginia Riverside is banked. Falcon, Phoenix and Thomas continue to be the only furnaces running in the Mahoning Valley, while capacity in Northern and Central Ohio has been reduced by the blowing out of the furnace of the Cleveland Iron Company, the banking of Steubenville and the blowing out of Zanesville. The Hocking Valley has gained by the resumption of Akron. There have been no changes in the Hanging Rock region, although it may be noted that the Lawrence is to start at an early date. The product of the Illinois furnaces has been

relatively light in February, and capacity has been reduced by the stoppage of ore of the South Chicago plant of the Illinois Steel Company. Only one furnace is now on spiegeleisen and ferromanganese.

In the South changes have been somewhat more numerous than usual. Pulaski lost time on account of its gas explosion. Rockbridge is to resume during April.

In Alabama both Pioneer furnaces started in February, as did also one De Bardeleben and one Alice of the Tennessee Company. Lady Ensley has completed repairs. Chattanooga, in Tennessee, has blown out, the others remaining the same. Rising Fawn, in Georgia, is idle.

The position of the charcoal furnaces was as follows:

Charcoal Furnaces, March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	8	670	6	500
New York.....	8	1	109	7	693
Pennsylvania.....	16	1	80	15	850
Maryland.....	6	3	370	3	255
Virginia.....	18	3	110	15	785
Ohio.....	10	6	518	4	180
Kentucky.....	1	0	0	1	95
Tennessee.....	6	3	506	3	655
Georgia.....	4	0	0	4	610
Alabama.....	13	5	1,351	8	1,695
Michigan.....	27	14	4,207	13	3,610
Missouri.....	2	2	543	0	0
Wisconsin.....	5	5	2,630	0	0
Texas.....	3	1	176	2	430
California.....	1	0	0	1	120
Washington.....	1	0	0	1	170
Oregon.....	1	1	230	0	0
Totals.....	136	51	10,890	85	10,708

As compared with previous months the record stands as follows:

	Furnaces in blast.	Capacity per week.
March 1.....	51	10,890
February 1.....	56	11,365
January 1, 1891.....	50	12,280
December 1.....	67	12,738
November 1.....	70	13,262
October 1.....	66	13,389
September 1.....	63	12,904
August 1.....	59	10,745
July 1.....	61	12,511
June 1.....	61	12,312
May 1.....	52	10,068
April 1.....	52	10,804
March 1.....	50	12,606
February 1.....	58	11,378
January 1, 1890.....	59	11,485
December 1.....	66	12,779
November 1.....	67	12,898
October 1.....	63	12,047
September 1.....	60	11,327

A reduction in the output has taken place. Standish, in New York, is to be idle for three months to come, but Copake is expected to begin producing early in April. Boiling Springs, in Pennsylvania, went out on March 1 and will not blow in until May 15. Pine Grovestopped because its supply of charcoal is exhausted. Muirkirk, in Maryland, was forced to blow out on March 5, because it was found impossible to mine ore this winter, and the stock on hand has been used. In Virginia, Reed Island and White Rock alone are producing. In the Hanging Rock region Olive is again in blast, and Center is reported to follow early in May. Newberry, in Michigan, started toward the close of last month. The Southern Iron Company have blown out their Aetna furnace, in Tennessee, and their Attalla in Alabama, and in the latter State, too, Bibb is banked for repairs. None of the Georgia charcoal furnaces are running. Rome, the new furnace, is, however, to make its first cast on April 20, and Tallapoosa is to resume early in May. The new Texas furnace, the Lone Star, was to blow in on the 9th of this month. On the whole, indications point to a slightly larger production after the opening of spring. Still it is a fact worthy of note that so small a proportion of the charcoal capacity is actively

engaged. It is true, of course, that there are being carried on the records a large number of plants which may be virtually considered out of the race forever. They are unable in ordinary times to compete against the more modern works of the Northwest and of the South.

The anthracite and charcoal furnaces have added to their stocks on hand materially during the month just closed, while the aggregate stock of the coke furnaces has decreased slightly, owing to the prolonged idleness of the valley furnaces. Aside from the valleys, however, the coke furnaces have accumulated iron freely, and are now carrying more stock than a month since. On March 1, 63 anthracite furnaces, 14 of which were idle, whose combined capacity is 26,578 tons per week, were carrying a stock of 156,420 tons, and 46 charcoal furnaces, 8 of them idle, with a weekly capacity of 9825 tons, report a stock on hand of 133,158 tons. Coke furnaces to the number of 130, 45 of which were out of blast or banked on the 1st inst., whose aggregate capacity is 89,746 tons per week, were carrying a stock of 271,966 tons. Shenango Valley, Va., reports 13,463 tons on hand, against 58,793 tons at the time of the general blowing out of furnaces, and Mahoning Valley, in Ohio, had reduced its stock from 53,861 tons on January 1 to 11,794 tons on March 1.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 10, 1891.

The subject of the next Speakership and inferentially the composition of the next Committee on Ways and Means are thus early conspicuous topics of comment and speculation among the ponderous majority of the Democrats in the Fifty-second Congress. For the first time possibly in the history of Congress, and certainly during the past fifty years, the Democrats of the North outnumber their party friends in the South. Of the 237 which will constitute the Democratic vote in the next House, 121 are from the North and 116 from the South. The North has two conspicuous candidates for Speaker—Springer of Illinois and Bynum of Indiana. The South has about a dozen, the most prominent being Mills of Texas, Crisp of Georgia, McMillin of Tennessee, and Hatch of Missouri.

The leaders of the Northern wing have been conferring in a quiet way for the purpose of mapping out a policy. The usual practice, all things being equal, of promoting the senior of the minority of a committee to the chairmanship upon a change of parties would give the South 16 chairmanships of the 22 most important committees, and of the remaining 27 they practically control by an even larger proportion. Their Northern colleagues say that they will not support any Southern man for Speaker unless they can have an irrevocable guarantee that the personnel of the committees is made up of men representing States interested. They quote the outrage against the great manufacturing industries, wealth and manifold interests of great commonwealths like the New England group, New York, Pennsylvania, Ohio, Indiana and Illinois committed when Speaker Carlisle placed a man like Mills of Texas, who practically represents nothing in the line of economic interest, at the head of the Committee on Ways and Means, and made it up of Southern influence to a degree which rendered the Northern interests powerless to defend themselves. The Northern leaders charge that this led to the Mills revenue reform free trade measure, which wrecked the Democratic party in 1888.

The Northern influence realizes that the committees formulate legislation and are willing to make a fair deal, but it must be

in line with Northern interests where paramount in a committee.

It is evident that the composition of the Ways and Means Committee, particularly, will have an important bearing upon the solution of the Speakership problem. If Crisp or Mills or any one selected for Northern support shows any signs of continuing the grasping policy of the former Democratic Congresses and Southern domination, the Northern vote will go to a Northern man and important committees like the Ways and Means will be constituted accordingly.

The widening scope of government demand for the products of metallurgical industry is emphasized by the appropriations for fortifications and other works of defense, for the armament thereof and for the procurement of heavy ordnance for trial and service.

The items and amounts to be expended under the supervision of the Board of Ordnance and Fortification, under the act of 1888, for the fiscal year beginning July 1, 1891, are: For the manufacture (finishing and assembling) of 8-inch, 10-inch and 12-inch steel seacoast guns from forgings, \$70,000. For steel field guns of 3 and 5-inch caliber, \$25,000. For metallic carriages for field-gun batteries, \$61,000. For machines and for improvement of existing plant at the Watertown Arsenal, Massachusetts, for the manufacture of seacoast gun carriages, including those of new design, \$27,000. For projectiles for issue to the service—namely, for steel shell or shrapnel for field guns; for cast-iron projectiles for field and siege guns; for cast-iron projectiles for seacoast mortars of 12-inch caliber; for cast-iron projectiles for seacoast high-power and steel guns; in all, \$53,000. For steel shell for siege and seacoast cannon, \$15,000. For purchase and erection of steel plates for representative experiments upon armored decks, \$12,000. For steel armor-piercing projectiles for seacoast guns, \$100,000. For purchase and erection of armor-plate, for testing armor-piercing projectiles \$24,000. For testing one seacoast breech-loading rifled mortar, steel, of 12-inch caliber, \$15,000.

The Ordnance Bureau of the Navy Department are making elaborate preparations for a series of important armor plate trials on the Potomac ordnance proving ground next month. The trial plates will be 8 x 6 inches by 3 feet, produced by Carnegie, Phipps & Co., Pittsburgh. The test plates will be:

1. All steel.
2. All nickel alloy.
3. Nickel alloy treated by the Harvey decarbonizing process.

The Navy Department has ample funds to make these tests very complete, as it can draw to the extent of \$190,000 on the nickel ore appropriation of \$1,000,000. It is proposed to fire 20 shots at each plate with a 40-caliber 6-inch gun at 30 feet. It is proposed also to try a 10½-inch nickel plate. The Department expects in these tests and others to make important advances in the development of armor plate which will set the naval powers of the Old World thinking.

For purchase of oil tempered and annealed steel for high-power guns of 8, 10 and 12 inch caliber, in quality and dimensions conforming to specifications, subject to inspection at each stage of the manufacture, and including all parts of each caliber, \$800,000.

For the Army Gun Factory, Watervliet Arsenal, West Troy, N. Y.: For boring lathe and planer adapted to the manufacture of siege guns and howitzers in small gun shop at the army gun factory, \$4100.

To complete army gun factory building at Watervliet Arsenal, West Troy, N. Y., by the erection of south wing, inclusive of ways for traveling cranes, \$248,700.43.

For machinery, tools, power plant and fixtures adapted to the manufacture of steel seacoast guns, to complete the equipment of the south wing of army gun factory at Watervliet Arsenal, West Troy, N. Y., \$268,000.

For iron frame work, with adjustable platforms and centers for fitting up shrinkage pit, and for drainage of shrinkage pit at army gun factory, \$14,000.

For locomotive and cars or trucks for shifting guns and material and transportation between gun factory and river wharf, \$9000.

The Ordnance Board is also authorized to make all needful and proper purchases, experiments and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates and other implements and engines of war, and to purchase or cause to be manufactured under authority of the Secretary of War, such guns, carriages, armor plates and other war materials and articles as may, in the judgment of the board, be necessary in the proper discharge of the duty devolved upon it by act, \$150,000.

The Greatest Rod Mill Record.—The record on rod milling rolling has been again sharply raised. During the week ending March 7, the Joliet mill of the Illinois Steel Company rolled 1818 gross tons No. 5 rods, working ten hours a turn and eight hours on Saturday; in all 11 turns. The best record per turn of 10 hours was made on Friday, March 6, when there were rolled in the mill 314,750 pounds of No. 5 rods.

Alex. Laughlin announces that he has resigned the vice-presidency and disposed of his interest in the S. K. Smythe & Laughlin Co., engineers and contractors, at Pittsburgh. However, he has no intention of retiring from the engineering and contracting business, but will continue it as Alex. Laughlin & Co., with office in Lewis Block, Pittsburgh, Pa.

At a meeting of stockholders of the Union Switch and Signal Company held in Pittsburgh yesterday, the old Board of Directors, consisting of Robert Pitcairn, E. H. Goodman, R. H. Soule, H. H. Westinghouse, George Westinghouse, Jr., and George H. Christy, was deposed. A new board was elected, consisting of Edwin T. Waters, W. Scott Fitz and Sigourney Butler of Boston, Henry C. Terry and Owen B. Jenkins of Philadelphia, and G. P. Shane and A. T. Rowand of Pittsburgh. The new board organized by electing A. T. Rowand president; Sigourney Butler, vice-president; E. H. Goodman, general manager; Joseph Johnson, secretary and auditor, and H. C. Myler, assistant treasurer. The election of a new Board of Directors is a complete surprise to the business community of Pittsburgh, and it is not impossible that the election will be contested in the courts.

The Samson Steam Forge Works, at Chicago, were totally destroyed by fire on March 7, entailing a loss of about \$20,000. The building is located on the corner of Kinzie street and Sacramento avenue. It is 80 x 175 feet in dimensions and contained some very valuable machinery, all of which is warped by the heat and rendered useless. The origin of the fire is unknown, but is supposed to have occurred from an overheated stove or furnace. The loss on the building is \$5000 and on the machinery \$15,000. The machinery and building were fully insured.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, March 11, 1891.

The general situation is not improving. Wherever a better tone is manifested it is distinctly traceable to the effect of the Coke strike and not to a widening of the market. Should the strike continue long enough it will, of course, strengthen all values and may then start a general buying movement, which would maintain prices for a considerable period; but a strike is such an uncertain quantity that its duration can only be guessed at. Meanwhile consumers are buying to cover only their actual daily needs, in the belief that prices must go lower. Freight rates from Eastern points are expected to be reduced on March 30 on all forms of Iron and Steel. This will hardly affect local prices, but will be of some advantage to distant manufacturers.

Pig Iron.—The demand for Softeners has been a feature of the past week; the makers in a position to guarantee prompt delivery have done a brisk business. With so many Ohio furnaces out of blast the supply of Softeners is now quite limited. A number of foundrymen have stated that they would be obliged to shut down shortly if they could not get more Soft Iron, yet they are not inclined to pay even a moderate advance, so that they can hardly view shutting down as a calamity to be avoided at any cost. Lake Superior Charcoal has shown signs of life; at least one round lot was sold last week in this market, and that to a consumer who was supposed to have had his requirements fully covered until fall. Other users of Charcoal are trying to buy at present prices for delivery beginning in August or September, but they are not meeting with success. The carload trade in Charcoal has been better for some days, and quite a volume of business is being done in that way. The manufacturers have not yet been able to agree upon any plan of concerted action, and it is now expected that the trade will drift along until some of them get discouraged and blow out. Standard brands are being held close to the mark, but new brands must be sold at prices which net the makers very little if any profit. Sellers of strong Coke Irons report a fair demand, but by no means as heavy as the previous three or four weeks. A growing shortage is reported in producing localities affected by the Coke strike and prices are firm. Foundrymen are not urging speedy deliveries on old contracts or the shortage would be more apparent than it is. We quote:

Lake Superior Charcoal.....	\$18.00 @ \$18.50
Local Coke Foundry, No. 1.....	15.50 @ 16.00
Local Coke Foundry, No. 2.....	15.00 @ 15.50
Local Coke Foundry, No. 3.....	14.50 @ 15.00
Local Scotch.....	16.00 @ 16.50
Ohio Strong Softeners.....	18.50 @ 19.10
Southern Coke, No. 1.....	16.25 @ 16.75
Southern Coke, No. 2.....	15.75 @ 16.00
Southern Coke, No. 3.....	15.25 @ 15.50
Southern, No. 1, Soft.....	15.75 @ 16.00
Southern, No. 2, Soft.....	14.75 @ 15.00
Southern Gray Forge.....	14.50 @ 14.75
Tennessee Charcoal, No. 1.....	18.50 @
Alabama Car Wheel.....	22.50 @ 23.50
Coke Bessemer.....	17.00 @
Hocking Valley, No. 1.....	18.25 @

Bar Iron.—The Bar Mills appear to be well supplied with work for their small trains, so that general specifications are quite firmly maintained at about 1.70¢, half extras, Chicago, for local Iron, and 1.60¢ at mill for Hocking Valley Iron on large trains. However, work is slack, owing to the depression of the car-building trade, and there is strong competition

for the few car orders coming up at intervals. Business of this character is being taken at prices ranging from 1.67¢, delivered, to 1.60¢ at mill. More car orders are in sight, but not enough to impart much strength to sellers of Bar Iron. Jobbers report a continued good demand from stock, with quotations at 1 90¢, full extras, for small lots and 1.85¢ for carloads.

Structural Iron.—The general market is strong, owing to the influx of orders from all parts of the country tributary to this center, but prices are unchanged. Almost every week sees the birth of another large building project here, and the contractors are very busy preparing estimates of cost.

Plates.—Buyers are very conservative at present, and some of the largest consumers allow themselves to run so short of stock that they are occasionally forced to buy carload lots from dealers, because they cannot wait to have their orders sent to the mill. Manufacturers are getting stiffer, and now ask from \$1 to \$2 ½ ton advance on former prices. Stove trade is fair. We continue to quote Nos. 10 to 14 Iron Sheets, 2.75¢ @ 2.80¢; Steel Sheets, 2.90¢ @ 3¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.65¢ @ 2.75¢; Shell Iron or Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.25¢ @ 5.5¢; Boiler Rivets, 4¢ @ 4.25¢; Boiler Tubes, 50 % off.

Sheets.—Inquiries for Black Sheets have suddenly fallen off, and manufacturers are not so stiff as they were. A few sales are reported at very low prices; a fair quotation for No. 27 Common is about 2.80¢ @ 2.85¢ at mill. Galvanized Iron is moving actively, but while manufacturers insist that they are firm, others are cutting more or less. Jobbers' prices are 3.30¢ for No. 27 Common, and 65 % off for Juniata Galvanized.

Merchant Steel.—Some pleasant features relieve the general dullness. The demand for high grades of tool steel is very good, and the implement makers are calling for more material than they estimated they would need when placing their season contracts. Otherwise general business is quiet. We quote Tool Steel 6.50¢ @ 7¢ and upward, according to quality. Usual quotations are 2.40¢ @ 2.50¢ for Tire Steel, 2.40¢ @ 2.75¢ for Open-Hearth Machinery, 2.50¢ @ 3¢ for Open-Hearth Spring, 2.20¢ @ 2.30¢ for Bessemer Machinery and 2.50¢ @ 2.75¢ for Toe Calk.

Track Supplies.—The Rail situation presents no new features thus far; only one mill is making Rails in this locality. Prices are unchanged, namely, \$31 @ \$32.50. Carload lots of standard sections are selling at \$33 for prompt delivery. Splice Bars are selling in a limited way at 1.90¢ @ 1.95¢ for Iron and 2¢ @ 2.05¢ for Steel. Spikes still bring 2¢ from mill and 2.10¢ from stock. Track Bolts with Hexagon Nuts are quoted at 2.85¢ to 3¢, according to size and specification.

Old Rails and Wheels.—Several sales of Old Iron Rails are reported, one of 1000 tons and the others of 100 to 300 tons. Prices realized were from \$23 to \$23.25. Dealers report only a light supply in sight. Old Steel Rails are temporarily dull for long lengths, but short pieces are in demand by Pittsburgh consumers at \$15 @ \$15.50, here. Selected long lengths have been offered at \$17 without takers. The market for Old Car Wheels is about \$17 @ \$17.50.

Scrap.—Quotations last week on mixed Steel should have been \$11; Coil Steel \$15. A great deal of Wrought Scrap is now being offered by railroads, and prices are weaker. Dealers are also more anxious to sell. Selling prices ¾ net ton are about as follows: No. 1 Railroad, \$18.75 @ \$19; No. 1 Forge, \$18 @ \$18.50; No. 1

Mill, \$13.50 @ \$14; Fish Plates, \$22; Axles, \$25; Pipes and Flues, \$12.50 @ \$13; Horseshoes, \$18.50; Cast Borings, \$8.50; Wrought Turnings, \$11.50; Axle Turnings, \$13; Machinery Cast, \$12.25; Stove Plates, \$8.50 @ \$9; Mixed Steel, \$11; Coil Steel, \$15; Leaf, \$16; Tires, \$18.

Metals.—Manufacturers of Casting Copper, having sold quite freely, are now firm at 11½¢, carload lots. Lake is quoted 14½¢. Spelter is in little better demand and quoted at 5¢ @ 5½¢, according to brand.

Pig Lead.—This market, as reported, has been fairly active, and sales will foot up about 400 tons, mostly at 4.10¢. During the week the low offerings have been confined to one refiner and Desilverized Lead. The closing is steady at 4.10¢ bid for Soft Missouri; 4.10¢ asked for Desilverized. Consumers throughout the country are holding off in their purchases, expecting they will be able to buy their supplies for spring trade at lower figures. This may be so, but the course of the market during the last few days does not point to a lower basis in the near future.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, March 10, 1891.

Pig Iron.—There has been no very decided change in the situation during the past week; a fair business is reported and furnacemen who have any iron to sell are pretty stiff in their views. However, there is a continued feeling of uncertainty caused by the coke strike, which is the key to the situation. As long as the strike continues the market will continue to hold firm. It is expected that the report for February will show a very material reduction in the district, as compared with that of January. There is no abatement in consumption, as the mills are generally in operation, some of them working up to their full capacity, and it is very evident, therefore, that the supply of the raw material is rapidly being reduced. Furnacemen are timid about contracting for future delivery, as they have no assurance of being able to secure coke, and consumers are not anxious to buy ahead, as they are impressed with the belief that as soon as the strike is over the price of pig iron will go lower. We quote prices for immediate or near-by delivery as follows:

Neutral Gray Forge.....	\$15.00 @ \$15.25, cash.
All-Ore Mill.....	15.75 @ 16.00, "
White and Mottled.....	14.00 @ 14.50, "
No. 1 Foundry.....	16.75 @ 17.00, "
No. 2 Foundry.....	15.75 @ 16.00, "
No. 3 Foundry.....	15.00 @ 15.25, "
No. 1 Charcoal Foundry.....	22.50 @ 24.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "
Bessemer Iron.....	16.00 @ 17.00, "

Advices from the Shenango and Mahoning valleys state that stocks out there are rapidly being reduced. Liberal purchases are being made there for shipment to Cleveland, Wheeling, Chicago and other points west of there, and, as a rule, at better prices than they can obtain in this market. Our city furnaces are well sold up and are not in position to sell for immediate or near-by delivery. While some few sales of Bessemer iron have been reported about \$17, cash, it is still to be had at the price quoted, and good brands of Gray Forge can be had at \$15, cash, although some few sales have been reported at \$15.25. It looks very much as if there would have to be a cheapening in the cost of ore, coke and limestone, and a reduction in railroad freight rates, and it is owing to the refusal to grant these concessions that the many valley furnaces suspended operations some time ago. It is rumored that already the Lake Ore companies have agreed to a concession, and that the railroads will no doubt do likewise, as some

of them are to a considerable extent dependent upon these valley furnaces for a living.

Muck Bar.—There is some inquiry, but prices have undergone no quotable change during the past week. We continue to quote at \$27 @ \$27.50, cash, with most of the business at \$27.25 @ \$27.50. There is some inquiry on the part of consumers to contract for future delivery at about \$27, but sellers, in view of the present condition of the pig iron market, are refusing to sell at the price last quoted.

Manganese.—Continues quiet, while prices remain unchanged. Small sales of 80 % domestic, for immediate or near-by delivery, at \$63 @ \$64.

Manufactured Iron.—There is a fair business in finished iron and prices are firmer, but unchanged. Indirectly the coke strike is affecting finished, as well as raw iron. City mills continue to quote bars at 1.75¢ @ 1.80¢, full extras; plate and tank, 2.10¢ @ 2.15¢; No. 24 sheet, 2.80¢ @ 2.85¢. There is a good deal of inquiry for sheet iron, especially for future delivery, with manufacturers generally indifferent about contracting ahead. At valley mills bars are still quoted at 1.65¢ @ 1.70¢, half extras. Skelp iron remains unchanged at 1.75¢ for grooved and 1.95¢ @ 2¢ for sheared, both four months, 2 % off for cash.

Structural Iron.—There is a fair demand, but prices continue weak, and, as will be noted, we have made some further reductions in our quotations. Channels and beams, 3.10¢; angles, 2.05¢ @ 2.10¢; sheared bridge plates, steel, 2.30¢ @ 2.35¢; universal mill plates, iron, 2.10¢; refined bars, 1.90¢ rates.

Steel Plates.—So far as we are advised there has been but little new business placed here recently, but the mills are pretty well employed in working up former contracts. Prices remain about as last quoted: fire box, 4.25¢ @ 4.50¢; flange, 2.80¢ @ 2.90¢; shell, 2.60¢ @ 2.70¢; tank, 2.25¢ @ 2.35¢. The price of the latter has been materially reduced.

Merchant Steel.—There is a fair business reported, with prices unchanged. Tool steel, 7¢ to 7½¢ @ 8¢; machinery steel, 2½¢; spring, 2½¢; steel bars, 1.90¢; steel tire, 2.20¢; crucible*spring steel, 4¢; do., machinery, 5¢.

Wire Rods.—There have been no sales reported here for some time past, consequently it is difficult to give reliable quotations. Consumers appear to be pretty well supplied and the mills are well sold up until May. Brokers aver that it is difficult to place an order for delivery before May 1 next.

Nails.—There is nothing new to report in connection with the cut nail trade; there is some inquiry and prices are reported firm at \$1.60 @ \$1.65, 60 days, 2 per cent. off for cash, for large orders with desirable specifications. Wire nails are quoted by manufacturers at \$2.15, 60 days, 2 per cent. off, but it is intimated that a desirable order might be placed at \$2.10. Large orders placed some time ago are now being worked up, and some manufacturers are beginning to look around again for business.

Wrought Iron Pipe.—There is a very good degree of activity reported for this season of the year, which will be increased as the season becomes more advanced. Prices remain unchanged. Discounts on black butt-weld, 47½¢; on galvanized do., 40¢; on black lap-welded, 60¢; on galvanized do., 47½¢; boiler tubes, all sizes, 50 % off; casing, all sizes, 50 % off.

Barb Wire.—Prices have been advanced materially and we now quote as follows: Glidden, painted, 2.85¢; Gal-

vanized do., 3.40¢; Four Point, painted, 2.80¢; galvanized do., 3.35¢.

Billets and Slabs.—There is a fair demand, with mills pretty well sold up; sales reported at \$26.50 @ \$27, mostly at \$26.50, which by the well informed is regarded as being nearer the market than \$27. There is an occasional effort made to boom the market, but these efforts as a rule do not amount to much, as they are generally taken for what they are worth. Nail slabs about the same as billets, with but little inquiry, so far as we can learn.

Old Rails.—There is some inquiry for old iron rails, with a sale reported at \$25.50. Old steel rails continue active, with sales of 3000 tons in different lots reported at \$18.25. It is said that consumers are pretty well filled up for the present, and that the demand is not as urgent as it was a week or more ago.

Railway-Track Supplies.—There is a fair business, which appears to be increasing, but prices remain unchanged. Spikes, either iron or steel, 2.05¢, 30 days, f.o.b. at works; splice, either iron or steel, 1.90¢ @ 2¢; track bolts, 2.90¢ with square nut, 2.90¢ with hexagon nut.

Old Material.—There is considerable inquiry for No. 1 railroad wrought scrap and the price has been advanced to \$21 ¾ net ton, at which price sales are reported. Sales car axles at \$27.50 @ \$28; cast scrap, \$14.50, gross; old car wheels, \$17, gross; steel rail and bloom ends, \$18 @ \$18.50.

Steel Rails.—The Edgar Thomson Works, after having been stopped several weeks undergoing repairs and improvements, have again been started up. There appears to be but little inquiry for rails, but the demand will, no doubt, improve later on.

Coke.—The coke strike in the Connellsville district still continues, and there is no telling when it will be brought to an end; of course there is very little business, nor can it be expected while the strike holds out.

(By Telegraph.)

The iron situation continues in a state of uncertainty and business is light in consequence. Reports from the coke region indicate that the strike will be over in a few days, but these reports must be taken with some allowance.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., Chattanooga, March 8, 1891.

Pig Iron.—While the market is devoid of any particular excitement, yet prices have been gradually stiffening up and have reached a plane about 75¢ higher than prevailed say one month ago. Were it not for the uncertain condition of affairs existing through the coke regions of Pennsylvania, and the liability of reconciliations at any time, prices would advance to a much higher figure in the immediate future. At least such appears to be the talk among Southern producers. As it is at present, furnaces are very careful in naming figures for large lots for long time future delivery. Sales are now being made in sufficient amounts to absorb the entire output of the stocks, and as a general thing run into the future some 30 to 60 days, while occasionally some contracts are made that reach up to deliveries in July and August next. A good standard quality of No. 1 foundry is now selling at \$13.50 on a basis of 60 days, free of commissions, while there is more demand for No. 2 at \$12.50 @ \$13 than the ability of the furnaces to respond to. There is not a corresponding demand for No. 3 and Gray Forge, although there

is an occasional spurt in the movement of No. 3 for Pipe foundries. Taking all the circumstances into consideration, the tone and feeling of the market is in a very conservative condition.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., March 10, 1891.

Pig Iron.—The general condition of the market is about the same as defined in our last report. Prices are fairly steady, but at the slight advance which was recently established there is nothing beyond a small hand-to-mouth trade. The feeling is becoming general that the strike in the Coke regions will soon be broken, and that the result will be lower prices for fuel. This, with the greatly reduced cost of Ores, naturally means correspondingly low prices for Pig Iron, for which reasons large buyers are not in the market to any extent at present. Stocks of good Iron at local furnaces are not large, and in the meantime the demand is about equal to the supply, so that there is no immediate prospect of change from the following quotations, which are for lots delivered in consumers' yards:

Ohio Softeners, No. 1x.....	\$19.00 @ \$19.50
Ohio Softeners, No. 2x.....	18.00 @ 18.50
Standard Penna., No. 1x.....	17.50 @ 18.00
Standard Penna., No. 2x.....	16.50 @ 17.00
Medium Penna., No. 1x.....	17.25 @ 17.50
Medium Penna., No. 2x.....	16.00 @ 16.25
Virginia, No. 1x.....	16.75 @ 17.50
Virginia, No. 2x.....	15.75 @ 16.25
Standard Neutral All-Ore Forge	14.75 @ 15.25
Ordinary Forge Cinder mixed..	14.00 @ 14.25
Charcoal Car-Wheel Iron.....	21.00 @ 25.00

A 1000-ton lot of Pulaski No. 2 Foundry was sold here to-day at \$16.25, ex ship.

Ferromanganese.—Sellers usually quote \$62 @ \$62.50 for 80 %, but a lot of several hundred tons was secured a few days ago at a fraction less than \$62, duty paid, New York.

Steel Billets.—Business is very dull, and although manufacturers quote about the same figures as for some time past, buyers are utterly indifferent and not inclined to make bids at any price, unless for such small lots as they must have at once. Prices are nominally from \$28, delivered, for Nail Slabs, \$28.50 @ \$29 for 4 x 4 Billets, and from that upward for higher qualities, but no recent sales are reported.

Steel Rails.—The Scranton-Lackawanna deal having again been closed, it is hoped that this time it will remain closed. Meanwhile orders that have been held in abeyance, pending some certainty in regard to the matter, are still waiting, in the hope that better terms than \$30 at mills may be secured. This is said to be a firm price, however, and so far as known no business has been accepted below that figure.

Muck Bars.—Holders try hard to get \$27, delivered, but as a rule buyers get all they require at about 50¢ less.

Manufactured Iron.—The market shows no more life or animation than it has for many weeks past. There is some business, of course, all the time, and the majority of mills have more or less trade that can always be regarded as their own. But it is in greatly reduced proportions at present, and there is little or nothing to supplement it from outside sources. How soon there will be no one knows, but at this season it is natural to look for some improvement, and the trade hope that the present year will be no exception to the general rule. Prices are about as quoted a week ago—no better—and they could hardly be worse. The only item of news in the trade is that the recently organized Reading Rolling Mill Company have been taken into the Beam and Channel combination, so that in that line, at all events,

steady prices may be looked for. Quotations for lots delivered are about 1.75¢ @ 1.85¢ for best refined Bars, 1.75¢ for Grooved Skelp, 1.85¢ for Sheared, and Plates as follows:

	Iron.	Steel.
Ship Plates.....	2.00 @ 2.10¢	2.05 @ 2.10¢
Tank.....	2.00 @ 2.10¢	2.05 @ 2.10¢
Bridge Plate.....	2.05 @ 2.15¢	2.15 @ 2.20¢
Shell.....	2.30 @ 2.30¢	2.30 @ 2.40¢
Flange.....	3.10 @ 3.20¢	3.50 @ 2.00¢
Fire-Box.....	3.75¢	3.25 @ 3.75¢

St. Louis.

Office of *The Iron Age*, 214 N. Sixth st.,
ST. LOUIS, March 9, 1891.

Pig Iron.—A fairly active demand can be reported for the week under review. A great deal of stress has been laid on the effect that the strike of the coke workers will have on the trade, and some large sales have been made with this argument as the special inducement. The advance of from 25¢ to 50¢ per ton recorded in last week's report has been sustained, and furnacemen are in a more independent position to-day than they have been for some months past. The outlook for an early settlement of the strike cannot be said to be very promising, although it is a difficult question to decide whether it will last one week or three months longer. It has already had the effect of stimulating trade, and it is only reasonable to suppose that should it last any considerable period, higher prices will prevail all along the line. Coke Irons are in good demand, and prices are relatively firm. To sum up the matter, the market is in a vastly improved condition in comparison with what it was two months ago, and while the advance may be only temporary, there is a possibility that the increased trade, which is naturally looked for during the spring months, may be the means of still further advancing prices. A conservative course is the safest to follow under the circumstances, as the chances for an advance or a decline are nearly even, and consumers cannot afford to run the risk. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry.....	\$15.75 @ \$16.25
Southern Coke, No. 2 Foundry.....	14.75 @ 15.25
Southern Coke, No. 3 Foundry.....	14.25 @ 14.75
Gray Forge.....	13.75 @ 14.25
Southern Charcoal, No. 1 Foundry.....	17.50 @ 18.00
Southern Charcoal, No. 2 Foundry.....	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry.....	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry.....	15.00 @ 15.50
Ohio Softeners.....	18.00 @ 19.00

Bar Iron.—The demand is only limited and is of a hand to mouth character. Large buyers seem to be holding off, and prices are only moderately steady. We quote as follows: Lots from mill command 1.70¢ @ 1.75¢. Small lots from store are quoted at from 1.85¢ to 1.90¢.

Barb Wire.—The recent advance is being maintained, although it cannot be said that business has increased to any extent. On the contrary, trade has fallen off considerably, although this can be attributed to the recent cold snap which has been prevalent throughout this section. Some jobbers are selling at prices less than those quoted herewith, but mills as a rule are adhering to the recent advance. We quote as follows: Painted, 2.95¢; Galvanized, 3.50¢; carload lots 10¢ per cwt. less than above prices.

Cleveland.

CLEVELAND, March 9, 1891.

Iron Ore.—Although there has been some talk of negotiations for Gogebic Ores there have been no additional developments, and, it is vigorously maintained, there will be no farther sales for several

weeks to come. It is confidently asserted that the sales from the Norrie Mine exclusively, announced last week, aggregate nearly 500,000 tons, and that the price, f.o.b. vessels lower lake ports, was considerably below \$4.75 per ton, in fact not far from \$4.50. Everything is so well planned for cheapening the cost of Ore to the furnacemen that it seems scarcely possible that the reduced price will be less than \$1.25 to \$1.50 per ton over last season's rate. Everything thus far done regarding lake transportation rates for ore has been on a basis of 90¢ or less from Escanaba to lower lake ports. Reports of sales from Chapin and other Menominee mines do not seem to be confirmed, although inquiries have been made. Estimates of the output for 1891 vary from 4,000,000 to 6,000,000 tons. If the furnaces remain shut down much longer it is quite probable that the production will fall below 5,000,000 tons. No haste is being made in forwarding the Ore to the furnaces, only about 1000 or 1500 tons being sent away daily, against 8000 or 10,000 tons a day one year ago. The lower lake harbors are still stacked mountain high with all grades of Ore. Plenty of cars could be furnished for moving them, but there is no demand from the furnacemen and consequently no activity.

Pig Iron.—As the stock piles are gradually reduced, prices become firmer and in some cases higher. Not very much business is being done, chiefly for the reason that there is very little Iron to offer. Many inquiries for Foundry Iron are reported, but dealers cannot name figures in the absence of the Iron asked for. A few sales of Bessemer at prices approximating \$16.50 @ \$17 are announced, but the amounts involved were generally small, and purchases were made as a rule to cover immediate wants.

Old Rails.—The demand is fair and prices are quite firm at \$25. A few sales are reported.

Scrap.—No. 1 Railroad Wrought at about \$20 @ ton, net, is in good demand. Cast Scrap is worth \$14 @ \$14.50, and Old Car Wheels \$17.

Manufactured Iron.—The market is reported quite firm at 1.75¢ @ 1.80¢ from the mills, with a fair demand.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, March 11, 1891.

Pig Iron.—A canvass of the local market shows that there has been little change in the prominent features during the week from those that were prevalent a week ago. The strike of Coke workers is still in force, although the settlement with some of the smaller operators was noticed a few days since. There has been no increase in production of Southern Iron, and, in fact, there are six furnaces out of blast in the Birmingham district, according to private information just received from that point. There has been quite an active inquiry for Northern brands, upon the basis of prices previously quoted. Inquiries for Southern grades have been quite active, and to-day several orders for 3000 tons were seeking placement. Much difficulty is found, however, in securing Iron for prompt shipment, although there are sellers at current rates for late delivery. Some buyers are seeking quotations on deliveries to be made in April, May and June. Taken as a whole, the volume of business during the week has been comparatively small, although there has been quite a satisfactory run of small orders placed. The furnaces both North and South show no disposition to relax prices, and although some low quotations have been made, they

have been made rather in a spirit of intimidation than anything else. Gray Forge and No. 3 Foundry Iron are the grades most in demand and the hardest to obtain. No transaction worthy of special comment has been made since our last report. We quote:

Foundry.		
Southern Coke, No. 1.....	\$15.00 @	\$15.50
Southern Coke, No. 2.....	14.25 @	14.75
Southern Coke, No. 3.....	14.75 @	14.00
Ohio Soft Stone Coal, No. 1.....	17.00 @	17.50
Ohio Soft Stone Coal, No. 2.....	16.00 @	16.50
Mahoning and Shenango Valley.....	17.50 @	18.00
Hanging Rock Charcoal, No. 1.....	21.00 @	22.00
Hanging Rock Charcoal, No. 2.....	19.50 @	20.50
Tennessee and Alabama Charcoal, No. 1.....	18.00 @	19.00
Tennessee and Alabama Charcoal, No. 2.....	18.50 @	19.50
Forge.		
Gray Forge.....	13.25 @	13.50
Mottled Neutral Coke.....	12.75 @	13.00
Car Wheel and Malleable Irons.		
Southern Car Wheel.....	22.50 @	23.50
Hanging Rock, Cold Blast.....	24.00 @	24.50
Lake Superior Car Wheel and Malleable.....	21.00 @	22.00

Louisville.

LOUISVILLE, KY., March 9, 1891.

Pig Iron.—The market has been very quiet, a sale of 1000 tons, basis of \$10.75, Birmingham, being the highest price at which Gray Forge was sold, and this was for a favorite brand. Lake Superior Car Wheel was offered here as low as \$20, the price being as low as this grade has ever been sold at here. The rolling mills are doing scarcely any business; the stove men report a falling off in trade and the railroads are scarcely buying at all, though their officers state that they are in need of supplies, but are compelled to retrench; as this, however, has been going on for some time it is thought that they will have to come on to the market and buy heavily before long. Car works report prospective orders, but the amount of work already booked is slight, and will not enable them to run full. The Coke strike has advanced Iron to the basis of \$10.75 for Gray Forge, Birmingham, and what sales are made are generally for prompt delivery, as buyers are not willing, for shipment the latter part of the year, to purchase on this basis. We quote:

Southern Coke, No. 1 Foundry.....	\$14.25 @	\$14.75
Southern Coke, No. 2 Foundry.....	13.75 @	14.25
Southern Coke, No. 3 Foundry.....	13.25 @	13.75
Southern Coke, Gray Forge.....	12.75 @	13.25
Southern Charcoal, No. 1 Foundry.....	16.00 @	17.00
Southern Car Wheel.....	17.00 @	20.00

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date March 9, 1891, say: The most important feature developed in the Pig Iron market last week was the continued call for Lake Superior Charcoal, particularly in the East, where manufacturers seem to be alive to the fact that the market is a low one; that while there probably will be enough Iron to go around without any trouble, they believe the only fluctuation in this grade of metal must be an upward one, in as much as the cost limit is what prices are down to at the present time. Some inquiry was seen for Southern iron and a few transactions were closed but were not noticeable for their size and can hardly be said to reflect the Southern market. No large transactions whatever have been reported to us. Altogether the position of the market can be said to be the same, and quotations are as follows:

Lake Superior Charcoal, all numbers.....	\$19.00 @	\$19.50
Lake Superior Coke, Bessemer.....	18.00 @	18.50
Katabdin (Maine Charcoal).....	23.00 @	24.00
Lake Superior Coke Foundry, all ore.....	18.00 @	18.50
Ohio Blackband (40 per cent.).....	18.00 @	18.50
Southern No. 1.....	16.00 @	16.25
Southern Gray Forge.....	14.25 @	15.00
Jackson County (Ohio) Silvery.....	18.25 @	18.75
Connellsville Coke.....	4.65	

New York.

Office of The Iron Age, 96-102 Reade street,
NEW YORK, March 11, 1891.

American Pig.—There has been more activity, and a slightly better tone prevails. Sales agents report that it is less difficult to secure prices asked. The supply of Foundry Irons continues limited, so far as the South is concerned, and it is by no means large as to Northern makes. The extreme range on Northern brands is \$17 @ \$18 for No. 1, \$16 @ \$16.50 for No. 2 and \$14 @ \$15 for Gray Forge. Southern sells at \$16.25 @ \$17.50 for No. 1 Foundry, \$15.50 @ \$16 for No. 2 and \$14 @ \$15 for No. 3, according to brand.

Ferromanganese.—The only sale of consequence has been one lot of 400 tons of Ferromanganese, deliverable 100 tons monthly, to a steel works in Eastern Pennsylvania, at private terms. We quote the market \$61 @ \$62. Importers claim that the material cannot be laid down at such figures, and that sales made on such a basis are speculative.

Billets and Rods.—In sympathy with the Western market the feeling is firmer, although the going into effect of the Steel Rail combination is not regarded as an argument for stiffening in Billets. In Rods the only transaction we have heard of is a small lot for immediate delivery, at \$38.50 at seller's mill.

Manufactured Iron and Steel.—Competition in Plates continues sharp, although at least one leading Western seller has practically withdrawn for the present. We quote Angles, 2¢ @ 2.10¢; Sheared Plates, 2.05¢ @ 2.25¢; Tees, 2.5¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2.05¢ @ 2.15¢ for Tank, 2.35¢ @ 2.6¢ for Shell, and 2.6¢ @ 2.7¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Rail Fastenings.—A moderate amount of business has been done. We quote \$1.90 @ \$1.95 for Spikes; 1.75¢ @ 1.80¢ for Angles, and 2.65¢ @ 2.75¢ for Bolts.

Old Rails.—The market continues lifeless. One feature is pointed out as deserving consideration, and that is that the rising tendency in Muck Bars may cause more attention to be given to Old Rails.

Steel Rails.—When we last wrote the Rail market was in a condition bordering on demoralization, and it was probably only the prospect of an early sharp decline which prevented a heavy business. On Thursday, however, the first efforts were made to bring about an adjustment of the trivial differences between the Lackawanna and Scranton companies, and yesterday the papers were finally signed which make their consolidation an accomplished fact. As we have repeatedly explained, it was only this which stood in the way of putting into force the agreement of the mills entered into provisionally some time past. That agreement does not attempt to fix the price at which the mills must sell. It provides merely for an allotment by fixed percentages, each month's aggregate sales, at the end of the month, being distributed in accordance with those percentages. An excess is paid for by the mill, while a deficiency entitles the works to an allowance at a fixed rate per ton. While it is certain that the arrangement will not add a ton to the demand, it is equally certain that it will not reduce consumption by more than an insignificant fraction. It will prevent ruinous slaughtering of prices, but will not allow any undue advance in them. There can be no complaint among consumers of the price, \$30 at mill or \$30.75 at tidewater, which is now generally asked, since it is as low as is consistent with a fair profit to the mills. The cost at Eastern works, with partial em-

ployment and at present cost of raw material, is generally estimated in the trade to be \$27 @ \$28, which leaves a moderate profit on investment and a fair allowance for depreciation of plant. During the week there have been sales by Eastern mills of about 15,000 tons in small lots. We quote \$30.75 at tidewater.

The Carnegie Association have moved to a very handsome suit of offices on the eighth floor of the Bank of America Building, 44 and 46 Wall street, Carnegie Bros. & Co., Edgar Thomson Works, being represented by C. H. Odell, agent, and Carnegie, Phipps & Co. by N. L. Waterman.

G. W. Stetson & Co., Wall street, have been appointed sales agents for the Antrim Charcoal Iron produced by the Antrim Iron Company of Mancelona, Mich. They are also agents of the De Bardeleben, Buena Vista, Graham, Max Meadows, Salem, Carbon, Ella and Hudson Pig Irons.

Metal Market.

Copper.—In some quarters it is claimed that a larger business has been effected since the mining companies reduced their nominal price for Lake Superior Ingot to 14¢. Evidence is wanting, however, of any departure from the conservative line of action that has characterized consumers' movements since the beginning of the year, and, judging from the freedom with which the metal is offered at the price named, the producers are still at a disadvantage. In other words, the market has a rather weak appearance. Production thus far this year is unmistakably in excess of home consumption and export requirements and leaves a considerable accumulation at the mines, upon which little or no impression can be made unless the consumption reaches phenomenal proportions, and, in the immediate future, greatly exceeds the average of the past two months. While the offering at 14¢ is liberal, it does not appear that a lower price has been openly quoted either by producers or outside holders, but the indications are that consumers will adhere to extremely conservative action as long as the mining companies endeavor to exact a higher price than that at which they are anxious to sell in foreign markets. Arizona Ingot is held at 12½¢ @ 13¢, but buyers for large quantities would very likely be accommodated at some concession. For ordinary casting brands 11½¢ @ 11¼¢ is generally quoted, but the market is by no means firm at that price.

Pig Tin.—Prices have varied to a greater extent than during the preceding week. The movement, however, has been solely in sympathy with the pendulations in the London market, where, to all accounts, there is practically no opposition to the maneuverings of the arch manipulators. Local speculation is still confined within a narrow circle, and reflects extreme caution on the part of most operators. It is no secret that there is an abundance of Tin here. The greater portion of it, however, is controlled by a few prominent firms, who place a higher valuation upon their property when local inquiries are made than upon Tin that may be ordered direct by out of town customers. That is to say, outside orders for moderate quantities are still taken care of at prices very close to the net cash quotations recorded on 'Change. Sales have been made at 20.10¢, net cash, for early delivery, but 20¢ was subsequently accepted for a round lot to arrive by steamer nearly due. The latter price, doubtless, fairly reflects present market value for round lots on the spot. The quotations given for jobbing quantities are 20¼¢ @

20¢. On Wednesday's call at the Metal Exchange 20.05¢ was bid, 20.20¢ asked for spot. March delivery was 20.05¢ bid, 20½¢ asked; April, 19.90¢ bid, 20¢ asked; May, 19.90¢ bid, 20¢ asked.

Pig Lead.—During the past week about 500 tons have been sold for early delivery at 4.30¢ @ 4.32½¢, and a few carloads at 4.35¢ for April or later delivery. The movement, however, reflects no greater urgency in consumers' wants or inclination to discount the future. The firmness that has developed, in point of fact, arises chiefly from indifferent offering on the part of smelters who, apparently, endeavor to create the impression that they have a great deal of confidence in the future. There is little or no speculative interest and jobbers are buying only as requirements to keep stocks in proper form may necessitate.

Spelter.—Early in the week under review six or eight carloads of prime Western were sold, for early shipment, at prices on the basis of 5¢ here. This movement was somewhat surprising in view of the previous reports of higher prices for Ores and alleged purchases on export account. At the present time, however, there is a firm feeling, and, while bids of 5¢ for round lots of certain brands might lead to business, there are few, if any, open offers at less than 5.05¢ @ 5.10¢ here. Western advices are bullish, and quote 4.70¢ at St. Louis as inside price.

Antimony.—The movement has been of merely routine character and at somewhat variable prices. Hallett's is quoted at 15½¢ @ 16¢; LX at 16½¢ @ 17¢, and Cookson's at 17½¢ @ 18¢, in wholesale quantities.

Tin Plate.—Business in this line has been slow and unsatisfactory, with prices irregular on both spots and futures. Coke finish Plates and Dean and D.R.D. Terns are somewhat lower, being freely offered. Stamping plates, on the other hand, are higher, while former prices rule on the balance of the list. Quotations for large lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.35; J. B. grade, do., \$5.45; Bessemer do., \$5.37½ @ \$5.40; Siemens Steel, \$5.55. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.75 @ \$6; Siemens Steel, IC basis, \$5.75; IX basis, \$6.75 @ \$7. IC Charcoals—Melyn grade, \$6.25; for each additional X add \$1.50; Allaway grade, \$6; Grange grade, \$6.10; for each additional X add \$1. Charcoal Terns—Worgetter, 14 x 20, \$5.62½; 20 x 28, \$11; M. F., 14 x 20, \$7.75; do., 20 x 28, \$15.50; Dean, 14 x 20, \$5.17½; do., 20 x 28, \$10.35; D. R. D. grade, 14 x 20, \$4.90 @ \$5.05; 20 x 28, \$9.90; Mansel, 14 x 20, \$5.05; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.15; do., 20 x 28, \$10.20; Dyffryn, 14 x 20, scarce, do., 20 x 28, \$10.50. Wasters—S. T. P. grade, 14 x 20, \$4.85; do., 20 x 28, \$9.62½; Abercarne grade, 14 x 20, \$4.85; do., 20 x 28, \$9.50.

New York Metal Exchange.

The following sales are reported :

THURSDAY, March 5.	
10 tons Tin, March.....	19.90¢
10 tons Tin, June.....	20.00¢
10 tons Tin, July.....	20.00¢
10 tons Tin, August.....	20.00¢
10 tons Tin, September.....	20.00¢
10 tons Tin, November.....	20.10¢
25 tons Tin, March.....	19.95¢
SATURDAY, March 7.	
25 tons Tin, March.....	20.10¢
TUESDAY, March 10.	
25 tons Tin, per S. S. Guy Mannering.....	20.00¢
25 tons Tin, per S. S. Guy Mannering.....	20.05¢

Coal Market.

Anthracite Coal operators met to-day to discuss spring prices, but probably find themselves in no position to make a change, unless it be to emphasize the necessity for producing less Coal. The Reading ordered a shut down, to take effect at once at mines in the Schuylkill region, as follows: Buck Ridge, Bear Valley, Alaska, Richardson, Otto and East Franklin. These are all big mines, but the Alaska tops the list, as between 1200 and 1500 tons are taken out each day. The Richardson's output is 900 tons a day, the Otto 900 tons, the Bear Valley 800 tons, the East Franklin 500 tons and the Buck Ridge about 300 tons. These mines have been steadily worked for a long time, and the order to shut down is said to have created surprise.

Other companies favor a like policy in all directions. How far individual producers will conform remains to be seen. Shipments for the week ending 28th inst. are reported as follows, compared with the same period of last year:

Regions.	February 28, 1891.	March 1, 1890.
	Tons.	Tons.
Wyoming.....	288,145	193,916
Lehigh.....	55,569	94,300
Schuylkill.....	177,170	144,796
Totals.....	520,884	432,913
Year to date.....	5,525,166	4,222,807

The Pottsville Journal says: "Unless the trade takes a most favorable turn we fear the penalty for this great increase will have to be paid later on by prolonged or frequent shut downs." Current prices realized are about as last reported, as follows: Egg, \$3.40; Stove, \$3.65; Chestnut, \$3.35; Pea, \$2.65 @ \$3; Buckwheat, \$1.50 @ \$1.60. Free Burning Broken as low as \$3.25—all f.o.b.

Bituminous firm at \$3.25. The Nottingham Colliery, operated by the Lehigh and Wilkesbarre Company, was interrupted by an explosion of gas.

Financial.

Business to some extent reflects the recent panic, recovery being a gradual process. At New York the transactions of the Clearing House for January and February show a decrease of 37.7 per cent. For the whole country during the same time, as compared with the previous year, the decrease was 83 per cent., and outside New York there was an actual gain, most noticeable in the Middle, Western and Pacific States. New England, however, went behind for the two months 5.4 per cent. Until within a few days New York has been quiet in speculative circles, but there are now supposed to be signs of returning activity, following a period of waiting. Wheat is stronger, attended with buying orders from Europe, in consequence of reports of bad crop conditions both in France and Spain. Sellers of breadstuffs also claim an advance. Receipts of hogs in Chicago since the beginning of the year are the largest on record, but the slender movement of grain, as particularly noted in the business of the Chicago and Alton Railroad, and this despite the attraction of good prices, shows that large shipments in coming months cannot be expected. Cotton, too, marks an advance, owing to delay in planting the new crop, due to continuous rains. Para rubber advanced 2 cents. In the grocery trade there are hints of a possible sugar famine, and coffee is firmly held. In dry goods the jobbing trade lacks spirit, and collections are a little slower.

Stocks were dull. On Thursday the January report of the Chicago, Burlington and Quincy, showing a deficiency after

providing for fixed charges, induced renewed selling of this property. Rock Island and Chicago and Northwestern were also sold down. Then came news from Buenos Ayres of a run upon the Provincial Bank, which caused an unsettled feeling. Chicago, Burlington and Quincy touched the lowest price recorded in 20 years. The bank statement caused no surprise, as the usual country demand at this season has fairly commenced and is likely to continue for some weeks. On Monday the report that the Argentine government had arranged a loan of about \$25,000,000 at 75 per cent. caused more firmness at the opening, but soon after bearish pressure upon Chicago, Burlington and Quincy, New England, Chicago and Northwestern, Lackawanna, Reading, and Central New Jersey brought about important declines, and on Tuesday the same influences were felt.

Government stocks were firm at quotations as follows:

U. S. 4½s, 1891, registered.....	102
U. S. 4½s, 1891, coupon.....	102
U. S. 4s, 1907, registered.....	120½
U. S. 4s, 1907, coupon.....	121½
U. S. currency 6s, 1895.....	111

Sales of bank stock—75 shares Tradesmen's at 100; 50 Corn Exchange at 250½, and 52 Chatham at 375½. Bar Silver in London 45d; Commercial Silver Bars in New York 98½¢ @ 99¢.

It is announced that on May 1 the firm of Kidder, Peabody & Co. will be reorganized and the New York and Boston houses will be separated and thereafter conducted by different firms. A decision is expected next Monday from the Supreme Court regarding the motion to advance the cases contesting the legality of the McKinley Tariff act. J. Edward Simmons was appointed receiver for the American Loan and Trust Company, and the bond fixed at \$200,000.

Money is easy and heavy. Treasury disbursements are expected to provide funds, ample even for the moving of crops. Gold exports were only about \$1,500,000. Time loans were in good request, and as the supply was comparatively small, the quotation was firm at 5% for all dates from 60 days to six months. Private dispatches indicate that many English houses have seriously felt the bursting of the South American bubble, but Muriel & Co. is the only firm thus far made public. The panic in Buenos Ayres was at least the pretext for a liberal selling of stocks here last week, although it was thought that few in this country are identified with Argentine affairs. The Russian withdrawal of gold from the Bank of England is offset by the arrival of gold from Brazil. The Bank of England directors support Mr. Goschen's pound note issue scheme on condition that the Bank of England have the monopoly of the issue.

The postal rates for bankers' sterling are \$4.86 @ \$4.89. The market is very dull.

The weekly bank statement showed a greater loss in reserves than was generally looked for, amounting to \$2,749,300, which reduces the sum held by the banks in excess of legal requirements to \$10,880,975. The items show a loss in cash of \$3,237,500, an expansion in loans of \$941,900, and a decrease in deposits of \$1,952,800. The detailed statement was given to the public for the first time since November 15, 1890. When the publication was suspended the banks were \$832,000 below legal requirement, but they gradually increased their reserves until January 24, 1891, when they were \$24,089,775 above the 25% limit. Since then there has been a steady decrease. The Park Bank now receives the heaviest deposits, having changed place with the Chemical in this respect.

As a check upon gold exports it was announced that a Government charge is made of 4 cents per \$100 of gold coin turned into bars at the Assay Office. An ob-

jector reasons that this device will fail of its purpose; that "if the cost of remitting gold is increased it may enable bankers who have funds on the other side to realize a fraction more for them before they begin to draw against shipments of bullion, but it will not diminish the outflow by a single pound." Any holder of coin ought to be allowed to exchange it without charge for the less expensive bars.

Exports of merchandise from this port for the week were \$8,629,000 and imports \$10,881,000. The total imports at New York for February cause surprise, the amount being \$43,859,000, exceeding any former February in the history of the port. The exports \$31,562,000, including \$5,000,000 in specie.

Imports.

Hardware, Machinery, &c.

Boettger & Hengi, Mach'y, cs., 13
Boker, Hermann & Co., Anvils, 143; Arms, cs., 95; Mds., cs., 10
Botany Worsted Mill, Mach'y, cs., 28
Delonge, Louis, Mach'y, pgs., 8
Downing, R. F. & Co., Iron Ware, cs., 2; Mach'y, pgs., and cs., 192
Finch & Lang, Mach'y, pgs., 11
Hartley & Graham, Arms, cs., 10
Herbert's Steam Jet Furnace Co., 1 cupola, 32 pgs.
Klauber, C. & Bros., Razors, etc., 1
Lau, J. H. & Co., Arms, cs., 19
Lowenstien, J. H., Mach'y, cs., 2
Mecham Arms Co., Arms, cs., 17
Meyer & S. Co., Cast Iron baths, 17
New York, Ontario and Western Railroad, Mach'y, cs., 67; ditto, bds., 39
Rankine, James, Mach'y, cs., 1
Shoverling, Daly & Gales, Arms, cs., 14
Sheldon, G. W. & Co., Mach'y, cs., 22
Taylor, Thos., Mds., cs., 3
Ward, Jas. E. & Co., Iron Ware, cs., 2
Werleemann, H., Arms, cs., 21
Wiebusch & Hilger, Hdws., cs., 10; Anvils, 227; Arms, cs., 12
Wright, Peter & Co., Mach'y, pgs., 5
Wyman, Chas. H., Arms, cs., 13
Young, E. L., Forged Steel Shoes, 240
Order—Mach'y, cs., 36; Hdws., cs., 3; do., cks., 8

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 11, 1891.

All markets have felt the effect of the financial uncertainties due to the Argentine troubles and ugly rumors circulated regarding the standing of prominent firms. Pig-Iron warrants were steady early in the week, but the collapse of the furnace-workers' strike caused anxiety to realize, and that, along with depression brought about by the withdrawal of the Warrant bill, led to a fall of about 1/9 in Scotch, 1/5 in Middlesborough, 1/6 in Hematites. Twenty Scotch furnaces are now preparing for resumption of work. Stocks in warrant stores have further decreased, despite the quiet condition of trade.

Favorable statistical exhibit and good consumptive demand served to harden Pig Tin prices early in the week, but subsequent slacking of speculative demand and fears of heavy shipments from the Straits this month caused a reaction, leaving the market in a spiritless condition.

The Copper market has been flat, and prices receded on Tuesday to £52. 12/6 for Merchant Bars, prompt delivery. Buyers are very cautious, owing to fears of large supplies coming from America, and the decrease last month of 1500 tons in the visible supply has little influence. Sales of Furnace Material recently include 650 tons Anaconda Matte, chiefly at 10/ per unit. Spot supply of choice Copper is moderate.

In Tin Plates there has been little doing and the market is weaker. Ordinary Bessemers have been offered at as low as 17/3. The market is unfavorably affected by delay in shipments from Swansea. Exports last month were 32,000 tons, of which 28,000 tons went to the United States. Total in February last year 24,000 tons, of which 18,000 tons went to the latter country.

Ship Plates are in better demand and prices are firmer, but there is no improvement in other Steel or finished Iron.

At a meeting of creditors of Maryport Hematite Company, a deficiency of £53,349 was shown. Goodwin's Jardine Works are in liquidation.

Scotch Pig Iron.—There is freer offering of makers' Iron now that furnaces are restarting, but prices quoted are nominal in a great measure. Latest transactions in Warrants were at 45/4 @ 45/5 for Scotch, 40/7½ for Cleveland, and 49/6 for Hematites.

No. 1 Coltness, f.o.b. Glasgow	72/6
No. 1 Summerlee, " "	" "
No. 1 Gartsherrie, " "	60/
No. 1 Langloan, " "	" "
No. 1 Carnbroe, " "	60/
No. 1 Shotta, " at Leith	72/6
No. 1 Glengarnock, " Ardrossan	60/
No. 1 Darnellington, " "	68/
No. 1 Eglinton, " "	50/

Steamer freights, Glasgow to New York, 10/; Liverpool to New York, 10/.

Cleveland Pig.—Business has been slow and the market is weak. Makers quote at 41/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Supplies are freely offered and prices are irregular. Makers quote 51/6 @ 52/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—There has been little doing, and prices are without change. English 20% quoted at 97/6, f.o.b. shipping port.

Steel Rails.—Makers offer freely, and lower prices are openly named. Heavy sections quoted £4. 12/6, and light sections £5. 5/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market is unsettled and prices are irregular. Makers offer at £4. 10/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Makers ask rather higher prices, but the demand is moderate and bids are no better. Bessemer, 2½ x 2½ inches, quoted at £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is no improvement in the demand, but makers ask higher prices. Bessemer quoted at £4. 12/6, f.o.b. at N. W. England shipping point.

Old Iron Rails.—The market remains quiet and prices are unchanged. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—A moderate business passing at unchanged prices. Heavy Wrought quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—Sales small and prices without change. Bessemer quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—Demand is slow and prices are unsettled. Parcels from second hands

offered lower. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	19/3 @ 19/6
IC Bessemer Steel, Coke finish	17/9 @ 18/3
IC Siemens	18/ @ 18/6
IC Coke, B. V. grade	17/6 @ 18/
Charcoal Terne, Dean grade	17/6 @ 17/9

Manufactured Iron.—The demand is showing little improvement, but sellers are rather firmer. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d.	£ s. d.
" Common "	8 10 0	8 15 0
Staff. Bl'k Sheet, singles	6 17 6	6 17 6
Welsh Bars (f.o.b. Wales)	5 17 6	6 0 0

Copper.—Very moderate demand today, and the market rather weak. Merchant Bars quoted at £51. 7/ spot, and £52. 7/6, three months' futures. Best Selected, £58.

Tin.—Demand fairly active and the market steady. Straits quoted at £90. 5/ spot, and £90. 10/ for three months' futures.

Lead.—Business moderate, but the market steady at £12. 10/ for Soft Spanish.

Spelter.—Business has been rather slow, and the market is easier at £23. 7/6 for Ordinary Silesian.

The Colorado Coal and Iron Company.

Under the management of E. J. Berwind, the well-known coal operator, and with the co-operation in the iron and steel department of men familiar with the trade, like F. L. Lehman of Naylor & Co., and Chester Griswold, formerly of the Troy Works, the Colorado Coal and Iron Company appear to have taken a new lease of life. When the new management took hold of the property there was a floating debt of over \$600,000. While in 1889 there was a deficit of \$192,818.38, the operations of the year 1890 show an increase of \$1,469,074 in gross earnings and of \$322,003.90 in the net earnings. The actual surplus of the year was \$239,997.16, which would allow of a distribution of a dividend of 2.4 per cent. It is deemed more advisable, however, to accumulate a working capital, and put the property on a better earning basis. The sales of real estate, not including in the statement alluded to, aggregate \$1,023,583.68, of which \$190,888.68 was cash and the balance on time payment. The expenditures for construction, development and equipment were very heavy, including \$93,699.55 in the coal department, \$6,821.80 in the coke department, \$229,601.36 in the iron and steel department, \$10,193.41 in the iron mines, and \$65,696.03 in the real estate department. Included in the improvements in the iron and steel works was the building of a cast iron pipe plant at an outlay of \$97,582.57, and \$72,680.14 on the two furnaces. The company have begun the building of a third stack and will build also a number of Davis-Colby roasting kilns.

The most serious question which has confronted the company for years has been the iron ore supply. Energetic measures were taken to secure it, and at the same time make the company less dependent upon the Leadville mines, of which about one-fourth of its mixture was composed. We understand that the developments during the past year have been of the most encouraging character.

HARDWARE.

Condition of Trade.

REPORTS from various sources indicate an evident improvement in the situation, as the demand has perceptibly increased and a tone of more confidence prevails. The severe weather of the past week or two still operates to depress trade, but orders are coming in more freely. In prices there has been comparatively little change, though, as noted below, some reductions on leading goods have taken place. The market is, however, steady, and in some lines there is a better feeling than prevailed a short time ago. There is still some complaint in regard to collections. The following report from San Francisco was received too late for use in our last issue:

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—Trade all along the coast, except in such places where it is impossible for the present to ship goods, owing to impassable roads and other impediments, still continues good. We have had considerable rain, which has caused a decidedly better feeling all through the grain and fruit producing parts of the State. It will also stimulate the mining interests where water is necessary in carrying on their operations. Money and collections still slow. We have to report a continued activity in building, and also a fair demand for heavy material in the manufacturing lines. Shelf Hardware not moving quite as rapidly.

St. Louis.

(By Telegraph.)

The Hardware trade does not show any decided improvement since our last report. During the latter part of February the demand commenced to fall off, and has continued to do so up to this writing. The constant changes in the weather, at times making the country roads impassable, has added considerably to the dullness. The trade is now watching the crop outlook, on which much of the future business will depend. Carriage Bolts are weak, and some low prices are now being made. The demand for Heavy Hardware is only fair. Shelf goods are not attracting much attention just now. Wire Nails are dormant, at \$2.35 from store. Barb Wire is dull. The recent advance is sustained to some extent. Some jobbers, with stocks of low-priced Wire on hand, are creating considerable disturbance in the market by quoting from 5¢ to 10¢ less than the recent advanced price. Collections are not up to the average.

Chicago.

(By Telegraph.)

Reports from different houses vary considerably as to the condition of trade. With some the demand is very active;

others find trade only fair, and here and there a complaint of dullness is met. Various reasons are assigned for this discrepancy. The houses doing the most business are those making special efforts to cover new territory, or pushing their old trade most vigorously. The houses complaining of dullness are handicapped by sickness among their salesmen, which causes their trade to suffer. Staple goods are now in but light demand, orders running mainly to straight Hardware. Steel goods are quiet, although they should be in demand at this season. The reason assigned is that prices are higher than last year, and buyers are holding off either because they expect lower rates later, or because they have decided to take on but light stocks. Builders' Hardware and Mechanics' Tools are in especially heavy demand, as there is so much building going on throughout the West.

Notes on Prices.

Cut Nails.—In this market there is a somewhat improved demand, but the condition remains substantially as at our last review. Although no advances are being asked by the mills, quotations are more firmly adhered to than they were a few weeks ago. Quotations are on a basis of \$1.60, at mill, for carload lots, with 30-cent average, and this price is quite firm, one or two of the mills who have been shading it having withdrawn their extreme quotations. Small parcels from store in New York are \$1.85 to \$1.90 for Iron, with 10 cents advance for Steel, and carload lots, f.o.b. New York, are held at \$1.75 to \$1.80.

Chicago, by Telegraph.—Steel Cut Nails are dull from first hands, but this was to be expected after two quite active months in this line. Manufacturers are trying to get slightly better prices for such Nails as are now wanted, and quote \$1.65, Wheeling, for 25-cent average. Jobbers quotations are unchanged at \$1.85, with 5 cents off for carloads.

Wire Nails.—The mills are evidently very busy with orders and prices are firmly maintained on a basis of \$2.15 to \$2.20 for carload lots at mill. Some of the manufacturers refuse to meet these figures. Small lots from store are held at \$2.40 to \$2.45, with 5 cents off for carloads.

Chicago, by Telegraph.—Manufacturers' agents are receiving inquiries for Wire Nails from some territory, but the demand is light in this particular locality. They regard the present lull as intermediate between the winter and the regular spring trade and look for an early and active business. Factory prices are \$2.25 to \$2.30, Chicago. Jobbers quote \$2.35, with 5 cents off for carloads.

Barb Wire.—The market is unchanged since our last review, the advanced prices agreed upon by the manufacturers being generally maintained. The advance has,

however, the effect of diminishing the volume of business, as the trade are not yet fully assured as to the permanence of the higher figures now ruling. Quotations are, as announced in our last issue, as follows:

Glidden Painted, per 100 pounds.....\$3.00
Other styles.....2.95
Carload lots.....10 cents less
Jobbers and railroads.....5
Galvanized.....55 cents advance

Terms 60 days, or 2 per cent. off for cash in ten days. These prices are f.o.b. Chicago, St. Louis, Pittsburgh, New York, Boston, Cincinnati, Buffalo, Indianapolis, Philadelphia, Cleveland and Louisville.

Chicago, by Telegraph.—The trade have not taken kindly to the recent advance, and not much business is being done either by manufacturers or jobbers. The latter quote 2.95 cents for Painted and 2.85 cents for carloads, with 55 cents advance for Galvanized.

Axes.—Important action was taken by the American Axe and Tool Company at their meeting last week, when a material reduction was made in the price of the goods, the price of first-quality Axes being put at \$7, instead of \$8, as heretofore. This action will be received by the trade with satisfaction, as the impression has prevailed that prices during the past year were unnecessarily high, and the reduction will be interpreted as indicating a disposition on the part of the company to keep prices at a reasonable figure. This policy will commend itself as wise, inasmuch as the maintenance of high prices would tend to encourage unduly outside competition. The company, in fact, while controlling by far the greater part of the Axe production of the country, disclaim any intention of establishing a monopoly, and refer to the economies which they are able to avail themselves of in producing and selling the goods, as giving them important advantages in the market. The following are the present prices in detail. Terms f.o.b. factory, and 3 per cent. discount for cash in 30 days.

SINGLE-BITTED AXES.	
First quality, plain bronzed.....	Per dozen. \$7.00
<i>Extras.</i>	
Weights 5 to 6 pounds.....	.50
Weights 6 pounds or 6 to 7 pounds.....	1.00
Beveled Axes.....	.50
Hoosier.....	.50
Hubbard's "New Idea" of an easy Chopping Axe.....	.75
All steel full polished.....	.75
All steel full polished Lippincott Phantom Beveled.....	2.50
All steel full polished Buffalo Beveled.....	2.00
All steel painted Buffalo Beveled.....	1.50
Axes put up in paper boxes.....	.50
Axes with special labels, lots of less than 100 dozen.....	.25
DOUBLE-BITTED AXES.	
First quality, plain bronzed.....	11.50
<i>Extras.</i>	
Beveled Axes.....	1.00
Hubbard's "New Idea" of an easy Chopping Axe.....	1.50
All steel full polished.....	1.50
Peeling Axes.....	1.00
Hand made.....	1.00
Axes put up in paper boxes.....	.75
SECOND-QUALITY AXES.	
Second quality, single bit.....	6.00
Second quality, double bit.....	9.50

HANDLED AXES.

Axes with No. 2 Handles, \$1.50 per dozen extra.
 Axes with No. 1 Handles, \$2 per dozen extra.
 Axes with extra Handles, \$2.50 per dozen extra.

Loaded Shells.—A reduction was made March 9 in the prices of Loaded Shells, the discount now being 40 and 10 and 5 per cent. On shipments of 20,000 or more freight will be equalized with Chicago, St. Louis or Cincinnati.

Glass.—There are no indications of encouraging features in the Glass market. Prices continue low and unsatisfactory. Small factories who are obliged to have money make such prices as will secure them a cash market for their Glass. The solid manufacturers who are financially able to stock Glass in their warehouses have been doing so rather than meet quotations; but this is becoming monotonous. There appears to be no likelihood of the factories now out of blast getting into operation again before the summer shut-down. As a relief for this unsatisfactory condition of affairs, reports have been circulated that the largest manufacturers will corner the Glass market by negotiating for the entire outputs of the smaller concerns who have been cutting prices, and will thus be able to advance prices and keep the market up. This plan is considered nearly impossible of accomplishment. There is some fear among Glass operators that a reduction in wages will be offered them for the next blast, to reduce the cost of production to manufacturers. It is stated, however, that a reduction of wages will not be considered at all. Prices remain unchanged on a basis of 80 and 5 per cent. discount on small lots and 80 and 10 per cent. discount for carloads, lower prices being made in special cases.

Anvils.—A reduction of about $\frac{1}{2}$ cent per pound has been made on Peter Wright's Anvils, and the price of these goods to the general trade in ordinary lots is now from 11 cents to 11 $\frac{1}{2}$ cents per pound.

Brass Kettles.—The following are the list prices of Spun Brass Kettles as used by the associated manufacturers, for whom E. A. Napier is agent, 19 Cliff street, New York. The practice of selling the goods by the pound has been discontinued and they are now sold by the dozen from this list. The discounts are 25 and 5 per cent. on Plain Spun Kettles and 20 per cent. on Kettles plated on the inside with white metal:

Spun Plain Brass Kettles.

Quarts.....	2	4	6	8	10
Inches.....	7x4 $\frac{1}{2}$	8x5	9x6	10x7	11x8
Dozen.....	\$3.60	5.40	9.00	10.80	12.60
Each.....	\$0.30	.45	.75	.90	1.05
Quarts.....	12	16	18	20	
Inches.....	12x9	13x9 $\frac{1}{2}$	14x10	15x10 $\frac{1}{2}$	
Dozen.....	\$14.40	18.00	20.64	23.40	
Each.....	\$1.20	1.50	1.72	1.95	
Quarts.....	24	32	40	48	
Inches.....	16x11	17x11 $\frac{1}{2}$	18x12	19x13	
Dozen.....	\$27.00	32.40	41.58	49.50	
Each.....	\$2.25	2.70	3.47	4.13	
Quarts.....	56	72	100	128	
Inches.....	20x14	22x15 $\frac{1}{2}$	24x17	26x18 $\frac{1}{2}$	
Dozen.....	\$65.34	79.20	108.90	136.62	
Each.....	\$5.45	6.60	9.08	11.38	

Spun Brass Kettles, Plated Inside with White Metal.

Quarts....	4	6	8	10	12
Inches....	8x5	9x6	10x7	11x8	12x9
Dozen....	\$5.40	9.00	10.80	12.60	14.40
Each.....	\$0.45	.75	.90	1.05	1.20

Quarts...	16	18	20	24	32
Inches...	13x9 $\frac{1}{2}$	14x10	15x10 $\frac{1}{2}$	16x11	17x11 $\frac{1}{2}$
Dozen...	\$18.00	20.64	23.40	27.00	32.40
Each....	\$1.50	1.72	1.95	2.25	2.70

Cordage.—The demand is light and the condition of the market in this line not very satisfactory, as prices are weak. Several of the mills have shut down for the present. The competition between the manufacturers composing the National Cordage Company and those outside of this consolidation continues active, and it is thought not unlikely that owing to it prices will be lower. There has, however, been no quotable change since last week. Somewhat lower prices are quoted for Cotton Rope as a result of the recent settling in this line, owing to the condition of the market for raw material.

Bright Wire Goods.—The meeting of the manufacturers, to which we referred in our last issue, was held last week, but no important action was taken with reference to prices, which remain as before.

Lawn Mowers.—The following are the prices announced by Graham, Emlen & Passmore, 631 Market street, Philadelphia, Pa., on their Philadelphia Lawn Mowers. They call attention to the fact that these Mowers have the makers' name, "Graham, Emlen & Passmore," cast on one wheel, and "Philadelphia Lawn Mower" on the other:

Hand Lawn Mowers.....	60 & 10 %
30-inch Pony Lawn Mowers.....	30 & 10 %
36-inch large Horse Mowers.....	30 %
Grass Edgers.....	40 %
Lawn Sweepers, hand or horse sizes.....	30 %
Extra parts or repairs.....	33 $\frac{1}{3}$ %

Trade Items.

THE ST. LOUIS office of the Salem Wire Nail Company, Salem, Ohio, has been removed from 123 Souard street to Room 200, American Central Building, Locust street and Broadway, John H. Heimbuecher, sales agent. The company refer to this as a more convenient location, and have fitted up, we are advised, one of the finest small offices in the country.

ANNOUNCEMENT IS MADE under date March 2, 1891, of the dissolution by mutual consent of the copartnership between John J. Tower and Polhemus Lyon, under the firm name of Tower & Lyon, 95 Chambers street, New York. The business will be continued as before by John J. Tower, under the style of Tower & Lyon. The withdrawal of Mr. Lyon is on account of the new connection made by him in which he will give his attention to the export trade, as noted below.

UNDER THE SAME DATE announcement is made by A. G. Sherman, sole proprietor of Sherman & Fearing, No. 100 Chambers street, New York, and Polhemus Lyon, late of Tower & Lyon, that they have formed a copartnership under the name of Sherman & Lyon as successors of Sherman & Fearing, for the transaction of the general export, import and commission business. We are advised that while the business of representing Hardware jobbers as their purchasing agents in this city will be carried on without change and with increased facilities, the firm will give special attention to export business. In furtherance of this department of their business, Mr. Lyon expects to start in a few months on an extended trip, during which he will visit the principal foreign markets as the representative of a number of American manufacturers, with whom arrangements have already been made, the success which attended his former trip having been such as to justify a second one, with an enlarged line

of goods. The firm also expect to make arrangements with some leading foreign houses to represent them as their purchasing agents in this country, and refer to their facilities for doing this advantageously in view of their present well-known connections. They will also do a general commission business. In this new departure these gentlemen, who are so favorably known to the trade, will have the best wishes for their success. The familiarity which Mr. Lyon gained with foreign markets during his recent trip round the world is regarded as giving him special qualifications for representing American manufacturers abroad.

THE COLUMBIA PATENTS COMPANY, controlling the Barb Wire patents, have secured an office in the Rookery Building, Chicago, where the headquarters of the company will hereafter be located, with Secretary Shurtleff in charge.

THE SAMSON CORDAGE WORKS, 164 High street, Boston, Mass., will on April 1 remove to new offices at 115 Congress street.

UNDER DATE March 2, H. & J. H. Tenk, Quincy, Ill., announce that they have converted their business into a stock company under the name of the Tenk Hardware Company. The following are the officers of the new corporation: Henry Tenk, president; F. W. Hufendick, vice-president; Aug. C. Stroot, secretary, and John H. Tenk, treasurer.

IN THEIR ADVERTISEMENT on another page of this issue the Stanley Works, New Britain, Conn., and 79 Chambers street, New York, call attention to their well-known line of Steel Butts and Hinges.

THE TROTTER REFRIGERATOR COMPANY, Rochester, N. Y., in their advertisement on another page, illustrate the Refrigerator which they are putting on the market, and call attention to its economical consumption of ice and absolute dryness.

THE PARTNERSHIP heretofore existing between W. K. Boone, Thos. H. Jones and J. J. Ewing, at Lima, Ohio, has, by mutual consent, been dissolved by the withdrawal of J. J. Ewing, who has sold his interest to Thos. J. Morris, who has been in the employ of the firm for 16 years. The business will be continued at the old stand under the same firm name as heretofore, W. K. Boone Company.

THE TRADE will observe the advertisement of T. C. Ward, 185 West Main street, Rochester, N. Y., which appears on another page, in which reference is made to his agency for the well known Cliff Seat Springs and the R. H. Wagon Bolster Springs. Mr. Ward was formerly president and treasurer of the Auburn Wagon Company of Auburn, N. Y.

JOHN FREY has sold a half interest in his Hardware business at Bellefontaine, Ohio, to F. P. Dickinson of the same place. The firm name has become Frey & Dickinson.

IN AN ITEM referring to the agencies of Richard R. Hoge, Portland, Ore., in our issue February 5, his name was erroneously given as Richard H. Hoge. The correct middle initial is R. as appears above.

FOSTER BROS. COMPANY have succeeded Foster Bros., Fulton, N. Y., and will carry on the business of manufacturing Butchers' Cutlery as heretofore under the same management. They will hereafter make all shipments from their New York warehouse, and they advise the trade that to receive prompt attention [all orders should be sent direct to John Chatillon & Sons., 85-89 Cliff street, New York, who will make all quotations at factory prices.

S. D. KIMBARK, Chicago, has just completed a large factory at Elkhart, Ind., erected for the express purpose of supply-

ing the trade with Buggy Bodies, Road wagon Bodies, Phaeton, Surrey, Carriage and Wagon Bodies, Ironed Wagon Bodies, Seats, Carriage Parts, Completely Ironed Vehicles in the White, Hickory and Oak Spokes, Carriage and Wagon Wood Stock. The factory is of brick 400 x 80 feet, two stories. It is stated that the facilities are unexcelled and that the advantageous position of the factory for both manufacturing and shipping enables them to produce work at a low cost.

THE FIRM of James Morton & Son, Omaha, Neb., have been succeeded by the James Morton & Son Company, a corporation organized under the laws of Nebraska, with a capital stock of \$60,000. The new company will carry out all contracts and assume all liabilities of the old concern, and the management will be continued as heretofore.

THE TRADE will observe on another page the advertisement of Alfred Field & Co., 93 Chambers street, New York, in which they call attention to a quantity of Sheep Shears, made by Isaac Greaves of Sheffield, which they are desirous of closing out. The quantities of the different sizes which they have in stock are given, with list prices and the discount at which the goods are offered.

AFTER PROTRACTED negotiations it is definitely announced that H. Knickerbacker, successor to Isaiah Blood, Ballston Spa, N. Y., has disposed of his plant for the manufacture of Axes, Scythes, &c., to the American Axe and Tool Company.

KELLY AXE MFG. COMPANY, Louisville, Ky., under date March 6, announce that they have improved and enlarged their works for making Axes, and have now a capacity of 60,000 dozen per annum. They also refer to the fact that they have recently visited the Axe factories in the United States other than the American Axe Company's to ascertain what their facilities are for making Iron Axes, and are in a position to take orders in that line.

CASSITY & CASSITY, manufacturers of Harness and dealers in Hardware, Implements, &c., Brownsburg, Ind., request us to correct the report that they have disposed of their business. They advise us that they have no desire to sell out and will continue the business as heretofore.

Electrical Hardware.

ELECTRICITY has become so large a factor in the household economy and in mechanics, that it cannot fail to attract the attention of the progressive and thinking man in every community. A few years ago the knowledge of the principles of electricity was confined largely to scientific men and electrical engineers, and with them it was comparatively limited. Since that time, however, the adaptation of electricity to every day uses in producing light, power and heat has been very rapid, making electric lighting, the running of cars and machinery by electricity or welding by the electrical current to be familiar and commonplace facts. In these and in other ways electricity is accomplishing great results. Electricity, however, is commonly surrounded with a halo of the mysterious, as if it were a subject too deep and complicated to be understood by business men. A few years ago about the same amount of ignorance existed among Hardwaremen in regard to warm-air, steam and hot-water heating. Now, however, with the aid of printed matter and

such information as is obtained in various ways, almost any Hardwareman who has a tin shop connected with his store can take a contract to put a heating plant in a residence, store or other building and make a successful job of it. Similarly in regard to electrical goods. As a result of the more general knowledge of electrical appliances there is an increasing demand each year for this class of Hardware, and this demand is being supplied by both large and small manufacturing concerns, who devote their entire energies to the making of electrical supplies. These goods are to be brought to the notice of people outside of the large cities, and there is no class of merchants who are better calculated to undertake this work of introduction than Hardwaremen, by reason of the mechanical education which they have received in the regular course of their business, and because the Hardware store would be the place a customer would naturally go to buy such goods or to obtain information concerning them.

Although the assortment of electrical goods in the Hardware line is already large, the limit has not been by any means reached in the applications which will be made of electricity in this field, and the progressive merchant in each town who carries even a limited stock of electrical supplies will be the one sought by the manufacturers to introduce new goods in this line as they are put upon the market. The amount of technical knowledge required by a merchant to successfully handle such electrical goods as are in constant demand to impart information to purchasers in regard to goods in this line, is not large, and may be acquired from catalogues and the other printed matter furnished by manufacturers. It is a branch of business which the Hardware merchant should familiarize himself with, to the extent of knowing where the best of each kind of articles may be obtained and at what prices. He should also consider the question as to the desirability of his carrying an assortment of leading goods in stock.

Warranting Crosscuts.

IN CONTINUATION of the discussion as to the desirability of warranting Saws and other Tools, we have received the following from a Hardware merchant in Western New York. Our correspondent gives, it will be observed, a statement of his practice, with a view to serving the interests of both manufacturers and consumers:

I have read the article on warranting Crosscut Saws in a recent issue, and it may not be amiss to give you my experience in the past four years. As long as I warranted that article in the usual way that retail dealers do I was having trouble all the time with some one about defective Saws, and it worried me not a little, as I wanted to do right by my customer as well as by the manufacturer, and yet not being an expert in this article I hit upon this expedient as being as near just to all concerned as I could think of. If a Saw was returned I would say to my customer that I will return it to the manufacturer, and if his expert pronounces it bad, then I will stand all expenses connected with

its transfer back and forth, but if it was pronounced all right then the customer must stand all the charges of sending it to the manufacturer and return. I would tell my customer that the manufacturer was as vitally interested in his getting a good Saw as he was, and therefore he could be assured of fair treatment. If he thought there was any doubt about the Saw he might take it home and give it one more trial, and that was generally the end of the matter. In the past four years I have returned only one Saw, and it proved bad—the manufacturer made it good—and I have no trouble now, and sell as many or more Saws than ever. Just so with Axes. I have not warranted one in four years without an extra price, and I have sold as many as ever, and therefore I have made a fair profit on what I have sold, and I have not had any large lot of broken Axes to return in the spring, on which I have made no profit. The manufacturers have got it in their power to do away with warranting their goods by doing their best and standing upon their reputation, and for one I wish they would do it.

Price-Lists, Catalogues, &c.

GEO. L. THOMPSON MFG. COMPANY Chicago, Ill.: Curling Irons and Hardware specialties. Hair and Mustache Curlers are shown in various styles and sizes; also Pinching Irons, Lamp Chimney Stove and Curling Iron Heater. The manufacturers state that they have devoted much time and attention to the details of construction and improvements in special machinery during their five years' experience in the exclusive manufacture of Curling Irons. They are now settled in their new factory and prepared to promptly execute orders for their goods.

BINGHAMTON SCALE WORKS, Osgood and Thompson, proprietors, Binghamton, N. Y.: Osgood U. S. Standard Scales, Union, Portable Platform, Wagon, Railroad Depot, Dormant Warehouse, Dormant Hopper, Coal Dealers', Miners' and Transportation Scales, Trucks, &c.

D. M. STEWARD MFG. COMPANY, Chattanooga, Tenn.: Steward's Patent Lava Electric Insulators and Soap-Stone Pencils. The Insulators are made for all electrical purposes, and it is claimed that they are exempt from atmospheric influence, and that they are also fire-proof.

OSWEGO TOOL COMPANY, Oswego, N. Y.: Small Tool and Steam Appliances, Adjustable Three-Roller Tube Expander, Tonkin Tube Expander, Giles Pipe Wrench, Stocks and Dies for Pipe, Hydraulic Screw Punch, Hydraulic Punching Bear, New Little Giant Screw Plates, Slate's Cutting-off Tools, Planer Vises, Metropolitan Automatic Injector, Hydraulic Jacks, &c.

S. D. KIMBARK, Chicago: Confidential quotations, February, 1891. This is issued as a price-list, valuable to buyers, in a compact form, a handy book of reference. While this does not cover their entire stock, it lists nearly all goods in daily and regular use by carriage makers, wagon makers and blacksmiths. Machinists' Supplies and many specialties and odd goods in Carriage Trimmings, Mountings and Hardware, Iron, Steel, Wood Stock, Tools and Machines are handled extensively by them, none of which are listed in this book.

BUHL, SONS & CO., Detroit, Mich.: Heavy and Shelf Hardware, Bar and Sheet Iron, Nails, Spikes, Chains and Washers, Challenge Iceberg Refrigerators, Water Coolers, Cream Freezers, Ice Tongs, Chisels, Ice Picks, Oil Stoves, Hose, Nozzles, Sprinklers, Spring Hinges, Poultry Netting, Revolvers, Rifles, &c.

SICKELS, PRESTON & NUTTING COMPANY, Davenport, Iowa; New York house, Sickels, Sweet & Lyon, 40 Park place.

Spring price current of Steel Goods, Post Diggers, Scythes, Hay Carriers, Shovels, Spades, Barrows, Lawn Mowers, Freezers, Horse Brushes, Curry Combs, Refrigerators, Door and Window Screens, Spring Hinges, Door Hangers, Wire Stretchers, Bird Cages, Pad Locks, Tackle Blocks, Bicycles, &c.

CENTRAL CITY BOLT COMPANY, Syracuse, N. Y.: Carriage Bolts, both common and Philadelphia pattern or full square, and the Barry Parlor Door Hanger. The Barry Hanger was originally made by the Syracuse Bolt Company, and is now being made by the above company, who are making an especial effort to have it more generally known and handled by the trade.

WILLIAM J. H. GLUCK, Baltimore, Md.: Deep and Shallow Stamped Ware, Flat Ware, Tinners' Trimmings, Japanned Ware, Toys, Pieced Ware, Brass and Copper Goods, Stove Boards, Milk Cans, Agate Ware, House Furnishing Goods, &c. His catalogue contains nearly 200 pages, each class of goods being given a department, with a numerically arranged index at the back. It is complete and compact in its arrangement, while the goods are shown in a large variety of styles and shapes.

THE THOMAS LAUGHLIN CO., Portland, Maine: Marine Hardware, Tackle Blocks, &c. In addition to a large line of Tackle Blocks, they show Anchors, Steerers, Galvanized Ship Trimmings, Yacht and Boat Trimmings, &c. Their 1891 catalogue is a handsomely bound book of over 100 pages, in which the typographical work and the paper used are excellent. A large variety of goods are shown in the Ship Chandlery line, with conveniently arranged lists and full descriptions.

AMES PLOW COMPANY, Boston and New York: Farming Implements and Machines, Plows, Harrows, Cultivators, Seed Drills, Seed Planters, Rollers, Horse Hoes, Hay Tedders, Grindstones, Horse-Powers, Hay Cutters, Grain Mills, Fan Mills, Wine and Lard Presses, Vegetable Cutters, Meat Cutters, Horse Radish Graters, Trucks, Barrows, Hand Carts, Wagons, Road Scrapers, &c.

BLISS, BULLARD & GORMLEY, Joe Bullard, agent, 78-80 Randolph street, Chicago: The Universal Hanger and the American Rat Trap. It is claimed for this Trap that it will not frighten rats, as it is constructed so they will enter it without suspicion of danger.

ST. JOSEPH PUMP COMPANY, St. Joseph, Mo.: Perfection Water Elevator and Purifying Pump. Attention is directed to their one piece Cup or Bucket, which, it is claimed, is so constructed that, in connection with the manner of fastening it to the chain, all former objections are overcome and perfect work is secured.

A. BALDWIN & Co., New Orleans, La.: Hardware, catalogue B of agricultural implements and machinery. This book, containing over 300 pages, bound with flexible covers, is fully illustrated, having descriptions and lists of the goods presented. The above firm state that in preparing this catalogue they have not attempted to illustrate their full stock of goods, but have devoted the following pages entirely to their agricultural machinery and vehicle departments. In addition to the goods enumerated herein, they also carry a full line of Hardware, Stoves, Cutlery, Guns, Pistols, Ammunition, Barbed Wire, Nails, Iron, Steel, &c. The catalogue contains an index, alphabetically arranged, is printed on good paper, presents an attractive appearance, and covers a large range of goods. The front cover shows a perspective view of their establishment, while the back cover is devoted to Garland Stoves, for which they are agents.

BRYDEN HORSE SHOE COMPANY, Cata-sauqua, Pa.: Boss Horse and Mule Shoes. The manufacturers claim for the Rolled Boss Shoes that they are perfect in shape, bright and beautiful in finish; that the fulling is of the width and depth ap-

proved by blacksmiths; that the crease holds the Nail Head absolutely firm and solid, providing the best possible fastening to the hoof and insuring long wear without becoming loose. The statement is made that the metal is especially prepared, double refined, always uniform, and that it will stand the severest tests of sledge or hammer, either hot or cold. The last few pages of their pamphlet are ruled for memorandum, which the recipient is requested to use, and to ask for a further supply when these are exhausted. The pamphlet is elegantly printed and carefully compiled. Its tables of weights, &c., will be of interest.

E. T. BARNUM, Detroit, Mich.: Wire and Iron Goods. A budget of catalogues, devoted to Wire and Iron Fences, Cemetery Fences, Vases, Settees, Chairs, Lawn Furniture and Statuary; Builders' Wire and Iron Goods; Antique Brass Bank and Office Railing, Stable Furniture, Jail Cells, Wire Signs, Cresting and Tower Ornaments, Balcony Railing and Fire Escapes. The more general use into which Art Wire and Iron Work is coming is referred to, together with their facilities for producing the same.

C. T. WILLIAMSON WIRE NOVELTY COMPANY, Newark, N. J.: Corkscrews, Wire Hooks Sash Lifts, Wire Screen, Ceiling Hooks, Cornice Picture Hooks, Coat and Hat Hooks, Picture Nails, Card Suspender, Bill Files, &c. Attention is directed to their large and varied line of Corkscrews. In this connection the manufacturers state that to prevent the trade being imposed upon by imitations they have adopted a trade-mark, which will be upon every box containing their first-class goods, which they warrant in every respect as A No. 1, being made of the finest crucible steel. Should any of their crucible or Norway steel goods upon trial prove defective in quality of steel or temper, they will be exchanged for good ones.

MCKINNON DASH AND HARDWARE COMPANY, Buffalo, N. Y.: Manufacturers of Dashes and fenders. These goods are made in a large variety of styles, adapted to all vehicles requiring Dashes or Fenders. Attention is directed to their Concealed Head Bolts, which, with the quality and finish of their goods, they hold responsible for the growth of their business.

HOLLOW CABLE MFG. COMPANY, Hornellsville, N. Y.: Preston's Braided Barbless Wire Fencing. This Wire is constructed of three No. 13 Spring Steel Wires braided together. The manufacturers claim that the Wire is braided, not twisted, and that the elastic properties given to it in its formation prevent it from breaking in cold or sagging in hot weather. The tensile strength, it is stated, is 2262 pounds, and that it runs about 16 feet to the pound.

HIBBARD, SPENCER, BARTLETT & Co., Chicago: Catalogue 110, Summer Sports, Bicycles, Base Ball Goods, Lawn Tennis, Croquet, Foot Ball, Hammocks, &c. Western agents for Slazenger & Sons' English and Wright and Ditson's Tennis Goods. The catalogue is fully illustrated, showing all of these goods in large variety.

HENDERSON BROS., Waterbury, Conn.: Improved Tumbling Barrels, Steel-Plate Friction-Geared Two-way Exhaust Tumbling Barrels, Friction-Geared Single Exhaust, with Steel-lined Wood Staves, Convex-head Tumbling Barrel, Exhaust or Non-exhaust Register and Stove Plate, square or rectangular; also for goods that require violent shaking to remove scrap; Foundry Tumbling Barrels, exhaust or non-exhaust; Two-compartment Water Polishing Barrels, Friction-Geared in pairs, Patent Friction-Geared Oblique Tumbling Barrels, Steam-Heated Tumbling Barrels, and Perforated Steel Barrel for bluing screws, also adapted for washing oily goods, made in brass for pickling to remove scale. Referring to Exhaust Tumbling Barrels, the manufacturers state that only about half the tumbling is required, as the rushing air separates the dirt from the goods, metal touches metal, and the

brightening begins at once all over. The barrel is perfectly closed except where the inlets and outlets for air are made, the outlets being connected with suction pipes through which the dust is drawn from the barrel and deposited in a convenient receptacle outside.

CHISHOLM STEEL SHOVEL WORKS, Cleveland, Ohio: Shovels, Spades, Scoops, Ditching and Drain Spades, Steel Plate Washers, Corrugated Steel Hasps with Staples, Steel Felloe Plates, Heavy Forged Steel Hooks and Staples, the Murgatroyd Coal and Ore Hoisting and Handling Machine, &c. This catalogue is neat in appearance and shows their full line of Socket Goods. The company state that through the agency of improved facilities their prices have been materially reduced. Attention is directed to the reduction in list prices of their "Superior" goods, also to the change list numbers, on pages 24 and 31, and in list prices of Thistle Shovels and Scoops.

THE ADVANCE MFG. COMPANY, Hamilton, Ohio: American, Medium American and Young American Cider Mills. Attention is directed to the construction of the main rollers, having alternate ribs and grooves on both rollers. The manufacturers claim that by this arrangement the cells of the apples are broken thoroughly, causing them to yield the cider freely.

TIFFIN AGRICULTURAL WORKS, Tiffin, Ohio: Ohio Farm and Logging Sled. It is claimed that the Ohio is made in the most substantial manner, so that it is suitable for any use for which a sled may be used on a farm, even for logging. These are made with runners 4, 5 and 6 inches wide. The wood parts of the runners in the different sizes are 2½ inches deep and are bent out of white oak.

GARDNER LADDER COMPANY, Chicago: Stepladders from 3 to 16 feet in length. The manufacturers state that their Success Ladders are made from selected Norway pine; the top step is held firmly by an iron bracket; the back standards are strongly braced; the steps are secured by heavy steel barbed nails and have triangle irons on the back of steps. They also make a cheap Ladder called the Standard.

WELLS WHIP COMPANY, Wellsville, Pa.: Leather and Cotton Fly Nets, Halters, Strap Work, Whips, Lashes and Switches, Round Leather, Huston's Lock-Knot Leather, Tine & Calfskin Lashes, Round Lash, Express and Ringrose patent; Carriage and Buggy Nets, Flat Lash Express Nets, Heavy Leather, Fair Russet, Western, Black and Special Team Nets. Attention is directed to Miller's Horse Net, which is described as durable, made of hard twisted cotton twine, which retains the original shape of the mesh and can be washed if soiled.

AKRON IRON COMPANY, Akron, Ohio: Wood-Split Pulleys, Patent Steel-Rim Pulleys, Patent Calendered Shafting, Fall's Patent Friction Clutches, Self-Oiling Hangers and Boxes, Couplings, Collars, &c. The company state that they make an exclusive specialty of Power-Transmitting Machinery.

MERCHANT & Co., Philadelphia, Pa., are directing prominent attention to the Alaska Roofing Plates, which they state is a brand that will meet the requirements of those who need a good Roofing Plate at a low figure.

A VERY NEAT and attractive trade catalogue has been issued by the John C. Jewett Mfg. Company, Buffalo, N. Y. The publication is taken up with an account of the Jewett Refrigerators of their manufacture, and contains many well-executed engravings representing a variety of styles. As described on the title page, the goods include special Refrigerators Class AA, for restaurants, hotels, residences, grocers, druggists, &c. In the beginning of the pamphlet is a general account of the Jewett Refrigerators with reference to their special features. After

that come 15 pages of illustrations. Instead of presenting the Refrigerators in plain and bare mechanical cuts, a considerable amount of decorative skill has been employed in illustrating them attractively. Two or three styles of a Refrigerator are in some instances grouped upon a page, and in addition to the mere representation of the article, there are cuts of provisions, game, meats, &c. At the end of the pamphlet are lists of references. The catalogue is printed on exceptionally fine paper and is tastefully bound in paper covers.

It Is Reported—

That H. G. Watkins, who has been engaged in the Hardware business in York, N. Y., for the past two years, has sold out to Roselle Guthrie of Peoria, N. Y.

That C. F. Collins, Linneus, Mo., has sold his Hardware stock to Long & Hermann, who will continue the business.

That P. J. Chappel, Canton, N. Y., has disposed of his Hardware business to Jamieson Bros.

That Adams & Co., Decatur, Texas, have been burned out.

That J. H. De Haven of Rumble & De Haven, Conway, Iowa, has purchased the interest of his partner and will continue the business under his own name.

That J. S. Winn has bought an interest in the Hardware store of Cadick & De Reuler, Rockport, Ind.

That C. H. Hodges will open a Hardware store at Centerville, Iowa.

That B. H. Avery, Hardware, Cutlery, &c., Jefferson, N. Y., has disposed of his business to B. Davenport.

That J. R. Blake, Holliston, Mass., will soon retire from the Hardware business.

That Chas. M. Norton has purchased the Hardware business of G. E. Breck & Co., Lansing, Mich.

That Chas. H. Denning, formerly of Lowell, Mass., is now a member of the Hardware firm of Brooks & Denning, Montpelier, Vt.

That Peter Bolz, Hardware dealer, Preston, Neb., has been burned out. His loss is estimated at \$2000.

That R. I. Peatman and Leonard Knox are partners in the Hardware business at Centerville, Iowa.

That D. L. Whitemack & Co. have succeeded Whitemack, Bordine & Co., Tecumseh, Mich., in the Hardware business.

That Brown & Co., dealers in Hardware at Portage la Prairie, Manitoba, have dissolved. O. Brown will continue the business.

That J. M. Metzger will open a new Hardware store at Iliou, N. Y.

That W. D. Winger, New Holland, Pa., is building a new Hardware store.

That A. J. McGrew will open a Hardware store, in April, at Edison, Ohio.

That C. H. Leslie is a new Hardware dealer at North Muskegon, Mich.

That Gravert & Scott, Waterman, Ill., have dissolved partnership. William Scott will continue the business.

That Henry Jacobs will engage in the Hardware business at Shannon, Iowa.

That W. H. Roberts of the firm of W. & W. H. Roberts, Wellsboro, Pa., has disposed of his interest to William Roberts, who will continue the business in his own name.

That the firm of Brush, Moore & Co., retail Hardware, Cleveland, Ohio, have been succeeded by G. G. Arthur and F. W. Weidenkopf, under the firm name of Arthur & Weidenkopf. Mr. Arthur is a son of Chief Arthur of the Brotherhood of Locomotive Engineers, and Mr. Weidenkopf was formerly employed by the W.

Bingham Company, having had charge of their Builders' Hardware department.

That W. G. Popple's Hardware store at Hermon, N. Y., was destroyed by fire on the 28th ult. The loss is fully covered by insurance.

That F. P. Stoddard, Hardware, North Brookfield, Mass., has sold out to Sumner Holmes.

That James Mondall will open a Hardware store at Zelma, Ind.

That Partridge & Blake, Holliston, Mass., have sold out their Hardware business to George A. Bartlett.

That Mr. Hagedorn will open a Hardware store at Broadalbin, N. Y.

That Andrew Hanson, Greenville, N. Y., will remove his Hardware and Stove store to the premises formerly occupied by Vandewater & Burtis.

That Barlow Bros., Waterbury, Conn., have removed to a new store which has been attractively fitted up.

Law in Regard to Combinations.

THE RECENT decision of the Court of Common Pleas of New York, in the suit between DeWitt Wire Cloth Company and the New Jersey Wire Cloth Company, is of interest, as giving in some detail a statement of the law in regard to combinations which have the effect of restraining trade. In this case the DeWitt Wire Cloth Company brought suit against the defendants for goods sold and delivered, and the latter put in a counter claim for \$500, alleging that they and the plaintiffs were members of the combination, and that the plaintiffs received \$500 of the defendants' \$2000 which had been declared forfeited. The plaintiffs demurred to this counter claim, and Judge Pryor sustained that demurrer in the following decision, from which, however, we omit the references to the cases from which quotations are made:

In extinguishment of an admitted cause of action, the defendants plead that an equivalent sum is due them from plaintiffs, in virtue of the following allegations of fact: That three incorporated companies and two copartnership firms, engaged in the manufacture and sale of Wire Cloth, entered into an agreement whereby for the avowed object of "regulating the price" of the commodity they constituted themselves an association, imposed upon themselves stipulated rates of charge, engaged that they "will sell no Cloth at less than the prices set forth;" and to insure obedience to this undertaking, subjected themselves to a heavy penalty for its violation; that plaintiffs and defendants are parties to this agreement and association; that, pursuant to a provision of the agreement, defendants deposited \$2000 in the United States Trust Company to be forfeited to the other members of the association in the event that defendants should violate *inter alia* their obligation not to sell below the stipulated price; that the association declared the \$2000 forfeited; and that of this sum plaintiffs received and wrongfully retains \$500, which defendants counter claims against their indebtedness to plaintiffs.

The validity of the counter claim is challenged for formal defects, but as I am of opinion that the plea is bad in substance, I dismiss from consideration the technical grounds for demurrer.

The declared purpose of the agreement is to enable the association, as between its members, to "regulate the price" of the

commodity in which they deal, and this result is accomplished by empowering the association to fix a price, and by binding its members, under a penalty, not to sell below the sum so prescribed. Since all the members are to sell for the same price, of course competition between them is impossible, and, having power to fix the price, they will be impelled by the irresistible operation of self-interest to raise that price to the highest attainable figure. Here, then, is an agreement of which the inevitable effect is, in conformity with its proclaimed design, to restrict competition in trade, and to arbitrarily enhance the price of a commodity of commerce. That such a contract is repugnant to public policy, and so unlawful, is a settled principle in the jurisprudence of this country. The people have a right to the necessities and conveniences of life, at a price determined by the relation of supply and demand, and the law forbids any agreement or combination whereby that price is removed beyond the salutary influences of legitimate competition.

"With results naturally flowing from the laws of supply and demand courts have nothing to do, but when agreements are resorted to for the purpose of taking trade out of the realm of competition the courts cannot be successfully invoked and their execution be left to the volition of the parties thereto."

"In its very nature a right to exclude competition is injurious to the public."

"Public policy favors competition in trade, to the end that its commodities may be afforded to the consumer as cheaply as possible."

"Free competition is the life of business, and all combinations for the purpose of raising or controlling the price of merchandise are monopolies and intolerable, and ought to receive the condemnation of all courts."

"The natural law of supply and demand is the best law of trade."

"Rivalry is the life of trade. The thrift and welfare of the people depend upon it."

"It is against the general policy of the law to destroy or interfere with free competition, or to permit such destruction or interference."

"Competition is the life of trade, and combinations and confederacies to enhance the price of any article of trade or commerce are injurious to the public, and, therefore, illegal."

"Whatever destroys or even restricts competition in trade is injurious, if not fatal to it."

"If the primary object of the firm was to prevent competition it might be considered as against public policy, and it would be condemned by proof that it was part of a conspiracy to control prices."

"The agreement was to prevent competition, and such competition it was not lawful for the parties to prevent or attempt to prevent."

"A combination to artificially enhance prices is inimical to the interests of the public, and all contracts designed to effect such an end are contrary to public policy, and, therefore, illegal."

"A combination to raise the price of lard is 'an unlawful plot,' and an indictable misdemeanor."

Thus, by the overwhelming, if not uniform current of authority, the agreement under criticism is condemned, as contrary to public policy and illegal.

Nor is the operation of the rule forbidding contracts restricting competition and enhancing price limited to trade in the necessities of life, but, as appears from the citations above, extends equally and alike to all commodities of commerce. Neither need the agreement or combination, in order to expose it to the denunciation of the law, constitute a complete monopoly or effect a total suppression of

competition; but the language of courts and of writers is, that if the agreement or combination tends to monopoly, or reduce or lessen competition, it is contrary to public policy and unlawful, because operating *pro tanto* an artificial enhancement of price.

It results, therefore, that, as defendants' counter claim demands the repayment of money received by plaintiffs upon an illegal agreement, the court will not interpose for its restitution. The familiar maxims, *Ex pacto illicito non oritur actio*, and *in pari delicto potior est conditio possidentis*, are fatal to defendant's contention.

Another vice in the agreement with which defendants' counter claim is implicated will suffice to invalidate it. By the instrument constituting the Wire Cloth Manufacturers' Association, it is provided that upon complaint made of its violation the accused member shall be condemned to forfeit his \$2000 deposit, which shall thereupon be divided in equal parts among the members who have determined his guilt and declared the forfeiture, and the answer alleges that the \$500 which defendants seek to reclaim was received by defendants as their share of the \$2000 deposited and forfeited by defendants. Plainly, the tribunal so created and so empowered is obnoxious to the criticism of the Court of Appeals in *Austin vs. Searing* (16 N. Y. 112), where said: "An agreement by which the members of an association undertake to confer judicial powers upon a body of men as a tribunal having authority to adjudicate upon alleged violations of the rules of the association, and to decree a forfeiture of the rights of property of parties adjudged to have been guilty of such violation, is void as against public policy, and the courts will not enforce such a contract, nor lend their aid to give effect to the decrees of a tribunal thus constituted." And if the courts will refuse to enforce such an agreement while executory, so will they decline to undo it when executed, but will leave the parties in the situation in which, by their illegal contract, they have placed themselves. The agreement under consideration is even more repugnant to law than that condemned in *Austin vs. Searing*, for it constitutes the persons who are to benefit by the forfeiture the tribunal by whom it is to be decreed—contrary to the principle of natural justice that no man shall be a judge in his own cause—a principle so inviolable that not even an act of Parliament can impugn it.

If, on the other hand, we suppose the agreement to be valid and the tribunal that inflicted the forfeiture legal, the same result follows—that defendants cannot reclaim money paid in conformity with their own contract and by the decree of a court of their own choosing.

In any view the counter claim is untenable, and the demurrer must be sustained.

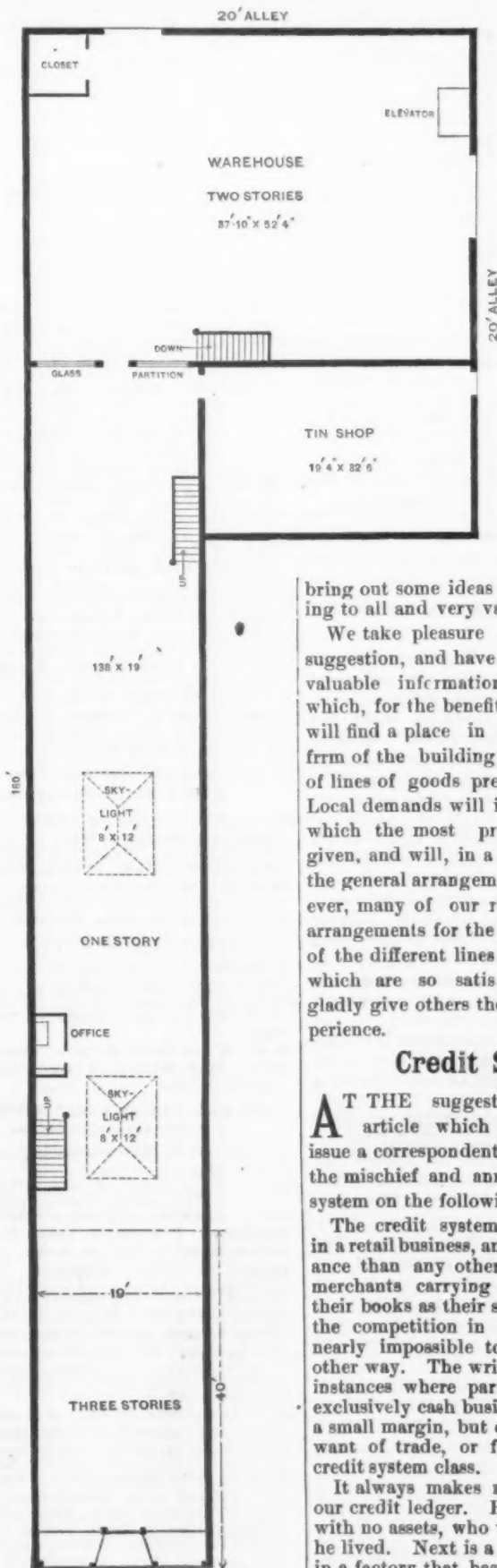
A Question of Arrangement.

WE HEREWITH GIVE the ground plan of the business establishment of C. J. Kirk, New Castle, Pa., wholesale and retail Hardware merchant, who is contemplating soon making improvements, putting up a new front and rearranging the furniture, office, &c. Desiring suggestions from the trade, he writes us:

The problem is: Given a store room 20 x 140 feet, with warehouse 40 x 53 feet and tinshop 20 x 83 feet, as shown, what is the best arrangement to carry a stock of general Hardware, consisting of a full line of Stoves, Ranges and Heaters, Tinware, Glass, Oils and Mixed Paints, Carriage Hardware, Farm Implements, Saddlery Hardware, Builders' Hardware (of which I make a specialty); also carry a line of Slate and Hard Wood Mantels and Tile

Hearths? You can see by the above that it is very necessary to have the best and most systematic arrangement possible to be able to do business at all. I do not say anything about the present arrangement, because it is as bad as it can possibly be;

running back 40 feet. From there to warehouse it will be one story; the tinshop and warehouse are two stories; have cellar under entire building. If you will be kind enough to place this before your numerous readers I have no doubt it will



C. J. Kirk's Store.

and I want entirely new and original ideas, if any one will be kind enough to suggest them. My present room is only two stories high in the front. I expect to tear it down this spring and run it up three stories,

bring out some ideas that will be interesting to all and very valuable to me.

We take pleasure in following out his suggestion, and have no doubt that much valuable information will be the result, which, for the benefit of all our readers, will find a place in these columns. The form of the building and the large variety of lines of goods present unusual features. Local demands will indicate the goods to which the most prominence should be given, and will, in a great measure, decide the general arrangement. Doubtless, however, many of our readers have perfected arrangements for the successful handling of the different lines of goods mentioned which are so satisfactory that they will gladly give others the benefit of their experience.

Credit System.

AT THE suggestion probably of the article which appeared in our last issue a correspondent in Illinois refers to the mischief and annoyance of the credit system on the following terms:—

The credit system is the worst feature in a retail business, and causes more annoyance than any other one thing. Many merchants carrying nearly as much on their books as their stock in store. With the competition in all lines it becomes nearly impossible to do business in any other way. The writer knows of several instances where parties started to do an exclusively cash business, selling goods on a small margin, but either had to quit for want of trade, or fall in line with the credit system class.

It always makes me tired to look over our credit ledger. Here's a man that died with no assets, who would have paid had he lived. Next is a mechanic who works in a factory that has shut down; he gets behind and we have to wait. Next is the farmer who rents and always pays while everything goes right, a poor crop or hog cholera knocks him out, he moves to another township or goes west before we are aware of it, and we get left. Then comes the carpenter and builder, who is nearly always execution proof, who runs an ac-

count and pays \$50 on account, and in a while owing to competition in his line, he takes jobs for less than he can afford to, and finally he decides to quit contracting and goes to work for some other carpenter (who thinks he can make a success of it), and the hardware merchant and lumber dealer pays for his experience as a contractor. Then there is the solid, responsible farmer, who runs an account from January 1 to December 31, when we send him a statement. Next time he visits the city he calls and tells us he is short of money, has just bought a lot of stock or another 80 acres of land that joined him, and he can't pay till next fall. We must smile and tell him that'll be all right, as we want his trade. So I might go on with the man who has no regard for his promise to pay, the new man that comes to town and pays part on a stove, &c., and wants a little time on the balance, and many others, by which we lose a nice share of our profits. I, for one can't see any way of improving matters a great deal. We intend to be careful in giving credit, but losses will occur in spite of every precaution, besides not having the use of our money. As regards collecting accounts, when a man has nothing and won't pay it's hard to force him, you may coax it. When a man has means and won't, we sue and make him.—

ONE OF 'EM.

From an English exchange we learn the Hardware trade on the other side are troubled by the system of credit in much the same way as merchants in this country. It says:

In London and other large towns there is ordinarily a much larger proportion of cash transactions, but even in the metropolis the suburban ironmonger often has much trouble with his accounts. It is in the country, however, that the credit system flourishes most vigorously, partly because it has always been more or less an institution of country life, and partly because some of the conditions under which agricultural pursuits are carried on are held to necessitate the concession of more or less credit. The farmers obtain goods on the promise to pay when the harvest has been secured, and other of the rural classes make a point of "settling up" at or about Christmas. In some cases the credits run indefinitely, and even with county magnates and members of the titled classes it is not uncommon for such a thing as a positive "clear up" of accounts to be deferred for eight or ten years at a stretch.

But the greatest worry of the retailer's business is probably the difficulty he experiences with those who are known bad payers, albeit generally regarded as being respectable members of society. These persons are to be found in pretty nearly every community. They are free buyers, often of the very best grades of goods, but will not pay until they are served with a writ or with a county-court summons. Ultimately they do discharge their obligations, always paying some 25 shillings in the pound, but never doing so until they have been worried, threatened, and perhaps sued. Often they are indebted to several ironmongers, grocers, and other classes of tradesmen in the same town at the same time, or they proceed to favor B with their custom directly A begins to ask for his money. If these persons happen to be of any social status, or have good connections in the neighborhood, they are very awkward to deal with in the way of getting in their accounts. They know it, and presume to the uttermost upon their influence and the alleged value of their custom. The local tradesmen are puzzled how to secure payment of their accounts without giving offence, and often go on from bad to worse until the debt is worse than one which is bad under ordinary conditions.

Exports.

PER BARK AMBASSADOR, FEBRUARY 28, 1891, FOR ADELAIDE, AUSTRALIA.

By Fairbanks & Co.—6467 pounds Scales.
By Edward Miller & Co.—25 packages Lamp Goods.

By J. A. Babcock & Co.—640 pounds Plated Ware.

By Tower & Lyon.—3 cases Hardware.

By Russell & Erwin Mfg. Company.—12 packages Hardware.

By H. Disston & Sons.—1893 pounds Hardware.

By Rogers, Smith & Co.—6 boxes Plated Ware.

By Sargent & Co.—9 cases Hardware, 4 barrels Cow Bells and Ties.

By Winchester Repeating Arms Company.—6 Carabines, 12 sets Tools, 12 Main Springs.

By Adriance, Platt & Co.—103 packages Reapers and Mowers.

By Meriden Britannia Company.—11 packages and 1 box Plated Ware.

By R. W. Forbes & Son.—4 cases Wringers, 2 packages Carriage Hardware.

By W. H. Crossman & Bro.—1 box Shoemakers' Hardware, 2240 pounds Iron Nails, 5 gross Polish, 2 gross Razor Stropps.

By Arkell & Douglas.—303 dozen Axes, 4429 pounds Axes and Hatchets, 4160 pounds Axes, 3202 pounds Forges and Blowers, 3045 pounds Axes, 6 dozen Hammers, 12 dozen Lamps, 1/2 dozen Oil Stoves, 2 dozen Meat Choppers, 4 dozen Wringers, 3 dozen Axes, 10 dozen Snaths, 4 dozen Scythes, 6 dozen Rakes, 12 dozen Traps, 18 Stoves, 60 dozen Cow Bells, 3 dozen Whip Sockets, 1/2 dozen Wagon Jacks, 416 pounds Tacks, 220 pounds Butts, 9 dozen Wrenches, 4 dozen Hatchets, 9 dozen Wrenches, 1812 pounds Bolts, 6 dozen Rakes, 7000 Cartridges, 12 dozen Lanterns, 330 yards Wire Cloth, 1400 pounds Rivets, 28 packages Granite Ware, 20 dozen Snaths, 1 gross Egg Beaters, 1200 pounds Oil Stone, 6 dozen Bells, 4000 Cartridges, 37 dozen Meat Choppers, 7000 Bolts, 12 gross Glue, 14 dozen Levels, 3 gross Bench Screws, 16 dozen Braces, 3 dozen Money Tills, 12 dozen Wrenches, 30 dozen Hinges, 30 dozen Hammers, 18 dozen Wrenches, 100 dozen Clamps, 9 dozen Drills, 15 Lawn Mowers, 21 1/2 dozen Wringers, 113 Stoves, 56 Pumps, 50 dozen Scoops.

PER BARK JUPITER, FEBRUARY 28, 1891, FOR PORT NATAL, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—11 Scales, 30,000 pounds Barb Wire, 230 Plovers, 18 Churns, 28 Corn Shellers, 7 dozen Ladders, 28 dozen Edge Tools, 11 pieces Plated Ware, 6 dozen Choppers, 11 dozen Forks and Rakes, 141 dozen Carpenters' Tools, 8 dozen Wheelbarrows, 6 Wringers, 5 Washers 240 pounds Bird Cages, 90 dozen Hardware, 16 Agricultural Implements, 9 Scales, 26 Pumps, 3 Washers, 6 dozen Traps, 4 dozen Sad Irons, 194 dozen Carriage Hardware.

By W. H. Crossman & Bro.—15,000 pounds Barb Wire, 10 cases Hardware, 1300 pounds Nails.

By H. W. Peabody & Co.—3 cases Plows, 2 dozen Hay Knives, 1 case Pumps, 1120 pounds Bevels.

PER BARK SAYRE, MARCH 3, 1891, FOR ADELAIDE, AUSTRALIA.

By John A. Gifford.—5 packages Saddlery Hardware.

By W. H. Crossman & Bro.—20,000 She'lls, 225 feet Wire Cloth, 18 dozen Hammers, 15 dozen Agate Ware, 4 dozen Jacks, 10 dozen Grindstone Fittings, 4 dozen Wringers, 1 dozen Manglers, 6 dozen Rakes, 3 packages pumps, 2 dozen Wringers, 1 1/2 dozen Wringers, 8 packages Lampware, 2 gross Hinges, 2 cases Agricultural Implements, 448 pounds Stone, 1 dozen Axes, 11 packages Hardware, 800 pounds Nails, 4 cases Lamp Goods, 1 case Hardware, 1 case Lamp Goods, 7 cases Hardware, 2 gross Traps, 3 dozen Rakes, 1 dozen Saws, 6 Scales, 67 cases Hardware.

By McLean Bros. & Rigg.—1 dozen Wagon Jacks, 38 packages Harvesting Machinery, 6 dozen Meat Choppers, 6 dozen Hammers, 10 Ranges, 18 sets Axes, 24 dozen Lock Keys, 22 dozen Axes, 6800 feet Wire Cloth, 8 dozen Cow Bells, 6 cases Hardware, 42 Drills, 1 Vise, 39 Drills, 1 Pulley, 9 dozen Wrenches, 16 dozen Spring Butts, 3 Miter Boxes, 120 papers Lining Nails, 1 dozen Carpet Sweepers, 20 dozen Axes, 4 Windmills, 1/2 dozen Cork Pullers, 135 dozen Saws, &c.

By H. W. Peabody & Co.—87 packages Hardware, 6 dozen Wringers, 1 box Plated Ware, 47 packages Lampware, 4 Revolvers, 2 cases Mouse Traps, 5 cases Granite Ware, 4 cases Churns, 1 case Tills, 1 case Hoes, 1 case Barometers, 4 cases Glue, 30 packages Hardware, 1 package Levels, 1 case Stamped Ware, 26 packages Lampware, 3 crates Churns, 56 packages Hardware, 19 packages

Lampware, 4500 Cartridges, 1 case Rifles, 28,000 pounds Barb Wire, 1 case Shot Cases, 30 crates Stoves, 6 1/2 dozen Wringers, 95 packages Wheelbarrows, 8 crates Stoves, 18 cases Hardware, 1 case Carpet Sweepers, 24 crates Stoves, 3 cases Lawn Mowers, 8 cases Edge Tools, 1 case Hardware.

PER BARK EVIE REED, MARCH 6, 1891, FOR WELLINGTON, NEW ZEALAND.

By A. Field & Co.—57 Stoves.

By Arkell & Douglas.—8 dozen Meat Choppers, 6 dozen Hoes, 25 dozen Axes, 3 Plovers, 4 Lawn Mowers, 5 dozen Choppers, 6 dozen Traps, 1/2 dozen Wringers, 9 dozen Drills, 5 Stoves, 1/2 dozen Bone Mills, 1/2 dozen Lamp Goods, 105 dozen Lamp Goods.

By Lalance & Grosjean Mfg. Company.—504 pounds Household Utensils.

By Henry Disston & Sons.—1045 pounds Hardware.

By The F. B. Wheeler Company.—1 case Hardware.

By A. S. Lascelles & Co.—840 pounds Nails.

By W. R. Grace & Co.—50 dozen Axes.

By Mailler & Quereau.—22,438 pounds Barb Wire, 52 cases Axes.

By J. G. Rollins & Co.—1 dozen Meat Choppers, 4 dozen Fly Traps, 1/2 dozen Cooking Stoves, 1246 pounds Tacks, 1/2 dozen Manglers, 5 dozen Steel Rakes, 3 dozen Lemon Squeezers, 1 dozen Clothes Wringers, 1/2 dozen Lawn Mowers, 1 1/2 dozen Churns, 5 dozen Axes, 2 Stoves, 1 dozen Slep Ladders.

By R. W. Forbes & Son.—6 Seeders, 2 dozen Axes, 12 dozen Axes, 32 boxes Horse Nails, 2 1/2 dozen Wringers, 1 dozen Churns, 11 packages Builders' Hardware, 64 boxes Horse Nails, 12 dozen Lampware, 5 dozen Wringers, 7 packages Builders' Hardware, 4 cases Agricultural Implements, 1 case Carriage Hardware.

By W. H. Crossman & Bro.—8 Tube Cleaners, 7 dozen Sash Cord, 2000 pounds Horse Nails, 280 pounds Stone, 7 packages Lamp Goods, 1 dozen Wrenches, 6 packages Harrows, 15 Lawn Mowers, 2 casks Blocks, 2 crates Plow Parts, 4 Manglers, 2 cases Agricultural Implements, 9 Wringers, 3 gross Lead Pencils, 7 cases Hardware.

By H. W. Peabody & Co.—14 cases Hardware, 6 crates Churns, 100 pounds Nails, 3 dozen Wringers, 2 cases Axes, 5 crates Stoves, 1 case Lead Pencils, 320 pounds Bolts, 19 cases Builders' Hardware, 560 pounds Horse Nails, 4000 pounds Nails, 10 cases Edge Tools, 5 packages Builders' Hardware, 1 case Rat Traps.

By McLean Bros. & Rigg.—10 dozen Axes, 1 dozen Spring Butts, 100 Hammers, 1 dozen Cork Pullers, 15 Meat Choppers, 6 Pumps, 15 dozen Auger Bits, 1 Stove, 139 pounds Tacks, 2 dozen Locks, 2 cases Wire Goods, 1 gross Rat Traps, 3 Wheelbarrows, 6 dozen Wringers, 17 Lawn Mowers, 9 dozen Drills, 3 dozen Hatchets, 6 dozen Hammers, 1/2 dozen Manglers, 2800 Bolts, 900 pounds Horse Nails.

FOR AUCKLAND.

By Arkell & Douglas.—12 dozen saws.

By Meriden Britannia Co.—4 packages Plated Ware.

By W. Lunham.—2 cases Iron Bolts.

By W. H. Crossman & Bro.—1 gross Razor Stropps, 4 cases Lamp Goods.

By H. W. Peabody & Co.—125 packages Builders' Hardware, 8 dozen Wringers, 14 crates Churns, 46 cases Builders' Hardware, 3 cases Axes.

By R. W. Forbes & Son.—6160 pounds Nails, 7 packages Builders' Hardware, 4 cases Carriage Bolts, 10 dozen Hammers, 25 cases Lawn Mowers, 52 dozen Axes, 6 Harrows, 11 Stoves, 17 packages Builders' Hardware, 16 Scales.

PER BARK TILLIE BAKER, MARCH 6, 1891,

FOR BRISBANE, QUEENSLAND.

By R. W. Forbes & Son.—18 crates Stoves.

By W. E. Peck.—14 cases Lamp Ware.

By H. W. Peabody & Co.—6 cases Builders' Hardware, 1 barrel Hoes, 3 cases Axes, 20 cases Edge Tools, 1 case Fishing Tackle, 50 cases Edge Tools, 20 tons Barb Wire, 560 pounds Nails, 3 cases Rules, 238 packages Builders' Hardware, 133,000 Cartridges, 1 case Air Guns, 9 cases Wringers, 2 cases Traps, 2 cases Stencils, 17 crates Corn Shellers, 132 packages Stoves, 16 bundles Step Ladders, 1 package Hardware, 14 packages Plows, &c., 3 cases Lampware, 6 packages Builders' Hardware, 31 packages Stoves, 17 cases Refrigerators, 113 packages Builders' Hardware, 6 crates Corn Shellers, 2 cases Agricultural Implements, 4 bundles Ladders, 1 barrel Hoes, 8 packages Plows, &c., 210 pounds Nails, 1 case Wire Ware, 35 pounds Nails, 1/2 dozen Wringers, 5 packages Barrows, 7 crates Refrigerators, 1 case Freezers, 1 case Glue, 6 cases Builders' Hardware, 2 cases Bolts, 17 cases Refrigerators, 5 cases Step Ladders, 3 cases Stamped Ware, 12 cases Plows, &c., 51 cases Lawn Mowers, 18

cases Scales, 1 case Fishing Tackle, 9 cases Builders' Hardware, 2 bales Rubber Hose, 3 cases Corn Mills, &c., 6 crates Corn Shellers, 19 cases Builders' Hardware.

Paints and Oils.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The distribution of Paints by local jobbers and manufacturers who cater to the retail trade has not been satisfactory. The weather conditions until the past few days have permitted very little outdoor work in any quarter tributary to this market, and in the absence of improvement in that direction, orders have averaged light. In various lines of pigments used by grinders there has been a very fair movement, however, and the indications are that faith in a good spring season movement has not been abandoned, despite the rather disappointing experience thus far this month. Firmness characterizes values nearly all along the line, and in no line are the conditions such as would impair confidence in the slightest degree. In the Oil trade there has been very little change. A few instances are cited of some increase in sales, but the general movement is rather slow for the season and prices show unimportant variation. There are no indications of radical change in the immediate future.

Paints and Colors.

White Lead.—Sales by corrodors have not been up to expectations, nor has the movement of the cheaper varieties of pigment afforded entire satisfaction. As a matter of fact, business is still rather backward, and jobbers find as much cause for complaint as do the manufacturers. It is the general belief that unfavorable weather latterly is accountable in a good measure for the sluggish condition of trade. With improvement in this particular, however, a decidedly better movement later on is confidently expected. In the absence of any change in the condition of the market for Pig Lead or Oil, or in the general surroundings, manufacturers adhere to former prices, and jobbers are deviating in no marked degree from old prices.

Red Lead and Litharge.—There has been no change in the character of the demand from any quarter. As a whole, the movement is fair, and prices and terms remain the same as quoted for some time past.

Zincs.—Some importance is attached to reported sales recently of Ores for export to Europe, and rather higher prices asked in the West. No change has been made in prices of American Oxide, however, and none is contemplated. The movement continues free, but is chiefly in the form of deliveries on old contracts. Foreign brands are arriving in liberal quantities, but the supply is not excessive, and prices remain very steady.

Colors.—In the general situation there is no marked contrast with what was outlined last week. No disturbing influences have arisen in any quarter, nor has the demand varied to any marked extent. Prices seem to have very good support nearly all along the line.

Sales of English Venetian Red for future shipment continue on a fairly large scale and orders for American are fully up to the average. Prices for both varieties remain steady. Quicksilver Vermilion, it is reported, has been sold for forward delivery at open prices, and the probability is that the association figures will be reduced ere long should crude material continue as cheap as it is at present; on

prompt delivery there has been no change. Carmine is without change in any particular. Orange Mineral steady. Other dry Colors are moving in about the usual manner and chiefly at steady prices. Oil Colors have had somewhat better movement and purchases of ready-mixed Paints are also freer.

Miscellaneous.—The situation in the market for Chalk and Whiting remains the same as outlined last week. The same remark will apply to Barytes, Talc and Terra Alba, all of which are firm at unchanged prices.

Oils and Turpentine.

Linseed Oil.—City crushers have made no change in their prices. Domestic seed product sells at 56¢ and Calcutta at 62¢, with usual allowance for packages. Outside brands are cutting no important figure in this quarter. The manufacturers, to all accounts, adhere to the agreement made some time ago, rarely going below 54¢ for ordinary quantities; and at the difference in price local brands are given decided preference in this locality. The volume of business, however, is moderate for the season, although reports are general of improvement in sales during the past few days.

Olive Oil.—The speculative movement referred to in last week's report has been pushed with some vigor and claims are made of sales at as high as 80¢, while up to 85¢ is quoted. It does not appear, however, that purchases have been extensive outside of the speculative circle since the movement was inaugurated, and there seems yet to be some supply left in "outside" hands. In point of fact, a limited quantity may be had at 75¢ at the present time. The speculative interest assert that that Oil is not up to the standard in point of quality.

Cotton-Seed Oil.—Exporters have purchased about 3000 barrels of crude product the past week for direct shipment from the South. In the local market there has been fair buying of both crude and refined, chiefly low grades. While not of extraordinary volume, the business passing is sufficient to keep values firm, and sellers consider that prices have improved to the extent of 1¢ per gallon during the week.

Lard Oil.—The market is a shade firmer, with positive change in prices. The improvement is due to rather better demand from home-trade buyers, which, together with some movement on export account, has brought the volume of business above the average of the two preceding weeks.

Fish Oils.—Neither exporters nor home consumers have appeared more prominently as buyers of crude Sperm or Menhaden Oils, and, in the absence of business or change in the attitude of holders, values remain stationary. The refined products are moving out in a jobbing way to a very fair extent at firm prices. Whale Oils are in very moderate supply, and the offerings of Cod Oils are still light.

Cocoonut Oils.—No change has taken place in this line during the past week. Consumers are about the only buyers at present and their operations are governed by imperative wants. For stock on the spot and to arrive by ships near-by prices are the same as those quoted last week.

Spirits Turpentine.—The Speculative movement that figured as a conspicuous feature of the market last week has tapered off to slender proportions and the demand at present is of merely routine character. With supplies here and at the South well under control, prices remain firm despite the smaller movement. Spot quotations are 41½¢ for regular and 43½¢ for machine barrels.

A Century of Patent Law.

The past century has been especially notable for the multiplication of inventions of all sorts and the rapid industrial progress that has resulted from the introduction of these new mechanical ideas. This material advance has been due altogether to the inventors, but they could not have brought their ideas to perfection without the protection afforded them by the patent laws. The one hundredth anniversary of the American patent system, therefore, is an event of no little interest and importance. With a view to celebrating the occasion in an appropriate way steps are being taken for a gathering of inventors and manufacturers at Washington, D. C., April 8-10, 1891. In addition to suitably commemorating the birth of the American patent system, it is the hope of the promoters of this general meeting to organize a national association of inventors. A central committee has been formed to take the matter in charge, and make, if possible, the gathering a successful one in every way. The members of this committee represent the most prominent business interests in Washington, and several Senators, Representatives and other prominent public men are active in their co-operation. According to the programme drawn up for the occasion there will be five public meetings, besides receptions and excursions. An important feature of the meeting appointed for April 10 will be addresses by prominent inventors, scientists and others from all over the country. Among the speakers who are announced are Edward Atkinson, Hon. A. R. Spofford, Professor Thurston, Hon. Carroll D. Wright, Dr. John S. Billings and others; while the Hon. Samuel Blatchford, Justice of the Supreme Court, will give an address entitled "A Century of Patent Law." Several sub-committees are already at work, and it is hoped that the meeting will bring together inventors from every section of the United States and result in much permanent good to this most important class of the community. If sufficient funds can be collected, it is the intention to publish two or more large volumes containing the addresses delivered by the speakers, together with a series of biographies of the greatest American inventors. The treasurer of the Finance Committee is Hon. A. T. Britton, while the following is a list of the chairmen of the various other committees: Reception Committee, W. Cranch McIntyre; Committee on Public Comfort, W. C. Dodge; on Hotels, J. H. Whittaker, and on Private Boarding Houses, E. T. Fenwick.

The steamship Ferdinand Schlesinger, the largest vessel ever built on Lake Michigan, was launched from Wolf & Davidson's yard at Milwaukee, on the 7th inst. It is 328 feet over all, 308 feet keel, 42 feet beam and 22 feet hold. Its estimated carrying capacity is 3000 tons of iron ore. It is a duplicate, so far as its lines are concerned, of the steamship Fred Pabst. The new steamer is owned by Thomas Davidson, who has a three fourths interest; David Vance & Co. and W. H. Wolf. Capt. D. F. Craine will sail the vessel. It will cost, complete, about \$175,000.

The bottom of a ladle at the Amoskeag Foundry in Manchester, N. H., dropped out and 30 men were injured.

Lowell, Mass., will purchase a Worthington power of 10,000,000 gallons per day capacity for \$35,700.

The highest price for Arctic whalebone at first hands ever paid, \$5.10 per pound, was realized in this city a few days ago.

Nail Pencil.

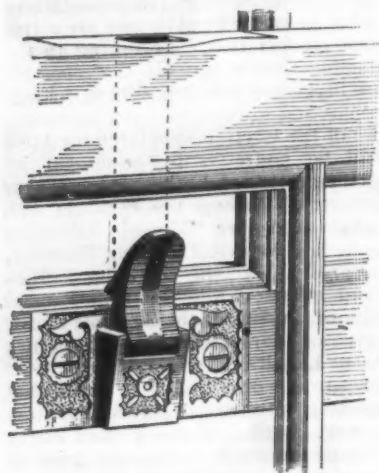
The Cross Pen Company, 168-170 Devonshire street, Boston, are introducing a novelty in the pencil line, as illustrated herewith. In appearance it is the *fac-simile* of a 20-penny wire nail, nickel

*Nail Pencil*

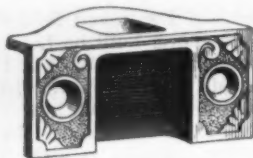
plated. The lead is held in a clamp, which is operated by revolving the head of the nail forward or backward. The article is neat in appearance, and its novelty, as well as convenience, will make it welcome even outside of the hardware trade.

The Automatic Sash Lock.

Ames Sword Company, Chicopee, Mass., are introducing a sash lock, as illustrated herewith. Fig. 1 shows the catch as placed on the inside of meeting rail of the upper sash. The strike or piece

*Fig. 1.—The Automatic Sash Lock.*

into which the catch automatically fastens, Fig. 2, is put on the outside of meeting rail of the lower sash. The dotted line in Fig. 1 shows the direction the catch takes on the outside of lower sash when closing the window. When the window is closed the figured faces of both parts of the sash lock are together. To unlock the window, the catch, which then appears above the meeting rails, is drawn toward the operator, after which

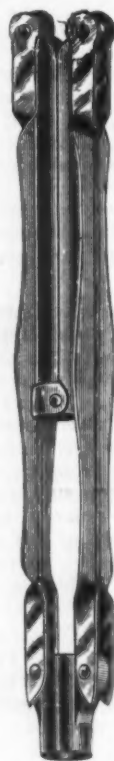
*Fig. 2.—Strike of the Automatic Sash Lock*

the sash may be opened. The manufacturers claim that it is automatic in action; that it is simple in construction; that it is burglar proof; that it has no projections above the meeting rail to mar the woodwork in window frame; that its proper working does not depend upon the care of the person using it; and that a window once closed is always fastened.

The New York scheme to develop South American trade by establishing steamship lines from Tampa, Fla., is being offset by the Illinois Central Railroad Company, who seek direct trade via New Orleans.

Elite Curling Iron Heater.

Geo. L. Thompson Mfg. Co., 183-187 South Canal street, Chicago, are introducing a curling iron heater, as illustrated in Fig. 1. This consists of an ingeniously constructed frame, made of brass nickel

*Fig. 1.—Elite Curling-Iron Heater.*

light, and keeps the curling iron clean while heating. When not in use it can be compacted, folded and carried in the pocket. When folded it occupies a space

*Fig. 2.—Elite Heater in Use.*

about 4½ inches in length by ¼ inch in width.

Peerless Lamp Chimney Stove.

Geo. L. Thompson Mfg. Company, 183-187 South Canal street, Chicago, are introducing a stove to be used on lamp chimneys, as illustrated herewith. This consists of two parts, Fig. 1, the stove and cover. The stove is 2½ inches in diameter, made of polished brass, nickel plated, and put up in single boxes. Fig. 2 shows the

application of the stove for heating. When using it for boiling the cap is removed, which exposes a 1½-inch surface

*Fig. 1.—Peerless Lamp Chimney Stove.*

of the vessel to the influence of the heat. The cover is used when heating curling irons, the cover being made double to

*Fig. 2.—The Peerless Stove in Use.*

thoroughly protect the handle of the curling iron from the heat.

The F. & H. Wire Cutter.

Peter A. Frasse & Co., 95 and 97 Fulton street, New York, are putting on the market a wire cutter, as illustrated here with. This machine weighs 6½ pounds, and can be fastened in a vise or screwed

*The F. & H. Wire Cutter.*

down on a bench. It has 14 holes graduated from ¼ inch to the smallest size, and an adjustable gauge to secure uniformity in the length of the wires cut. It is claimed that this cutter will cut wire to very short lengths and that it leaves no burr on the wire. Its points of excellence are referred to as strength, simplicity, durability, and the ease with which it cuts rods.

Cyclone Wheels.

Horton, Gilmore, McWilliams & Co., Chicago, are introducing Nos. 1, 2, 3 and 4 Cyclone Safeties, of which Nos. 1 and 2 are illustrated herewith. The No. 1 is described as having all steel forgings, 30-inch wheels, hollow rims, tangent spokes, ball bearings

rear brake. The weight of the No. 2 is 46½ pounds, geared to 54. Both of these wheels are made especially for American roads, have no cast material in their construction, and are put on the market as the highest grade of machines. No. 3 Cyclone is fitted with crescent rims and direct spokes; otherwise it is the same as No. 1



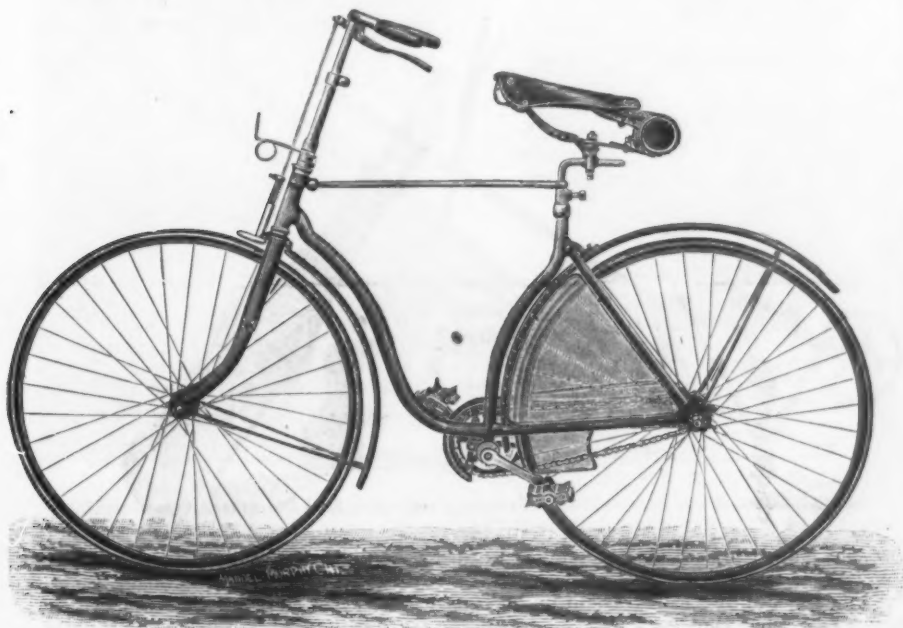
No. 1 New Cyclone Safety.

all around, diamond frame of weldless steel tubing, adjustable driving gear, Humber pattern chain, ball-bearing pedals, socket ball-bearing head, forged steel sprocket wheels, new and improved rear brake. Particular attention is called to the operation of this brake. When the brake lever is pressed it engages a grooved pulley on the wheel tire. The revolution of the pulley operates a cam-shaped brake above,

in all respects. No. 4 Cyclone is a 28-inch lady's wheel like the No. 2, but has crescent rims and tangent spokes.

Improvements in Rowlett's Champion Mower.

Champion Mfg. Company, Richmond, Ind., have made improvement in the parts



No. 2 New Cyclone Ladies' Safety.

which is gradually pressed against the tire, and stops the wheel without injury to the tire, nor so abruptly as to throw the rider off. The weight of the No. 1 is 50 pounds, geared to 54. The No. 2 Cyclone is a 28 inch lady's safety, with detachable brace rod, suitable for ladies, light-weight men, &c. It is made entirely of steel, with all the improvements of the No. 1 except the

of their Rowlett's Champion mower, as illustrated in Figs. 1 to 4 inclusive. Fig. 1 shows the cutting bar in position to attach to the side frame of the mower. The grooves at each end of the mortises receive the round bead at each end of the lugs, making a bearing for the oscillating adjustment of the cutting bar to the reel blades. As shown in Fig. 2, the round

steel pawl is carried within the body of the pinion around the shaft, and operated by a plate with a double incline fall on

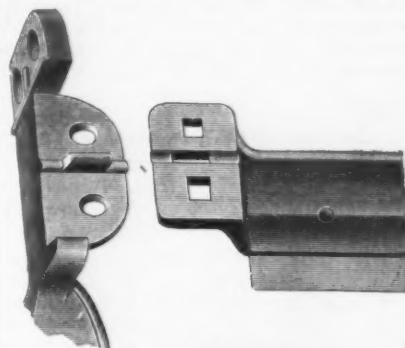


Fig. 1.—Cutting Bar.

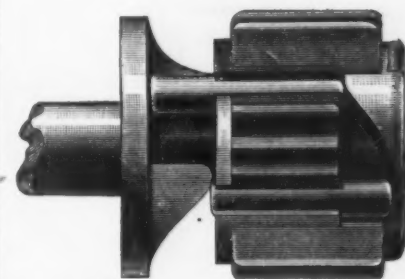


Fig. 2.—Pinion and Reel Shaft.

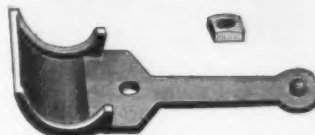
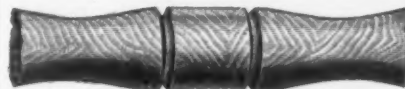


Fig. 3.—Handle and Attachments.

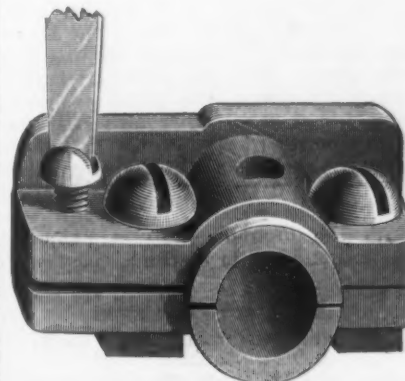


Fig. 4.—Reel Box.

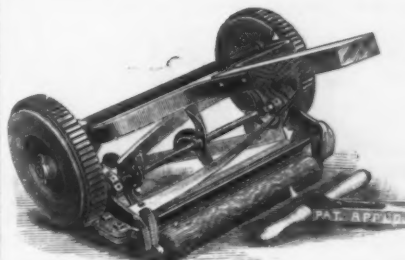


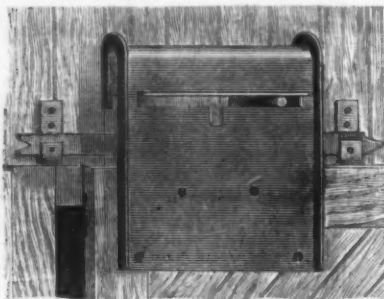
Fig. 5.—Rowlett's Champion Mower.

the outward end of the shaft. On the inside of the pinion there is a plate attached to the reel shaft. This plate is

provided with catches $\frac{3}{8}$ inch deep, which engage with the pawls, completing the lock with the pinion to the reel shaft. Fig. 3 illustrates the parts used in attaching the handle to the tongue. The clips are made of malleable iron, with a rib at each edge, which engages the grooves in the handle, and with two square bosses at the point where the end of the tongue joins the handle. The clips are attached to the tongue by a short bolt. Fig. 4 shows the reel box and the manner of taking up the wear. Fig. 5 illustrates the appearance of the finished mower, in which these improvements are used. The manufacturers claim for this machine original improvements, simple adjustments, quality of material and workmanship, lightness of draft and smoothness of cut. This machine is built with 8-inch drive wheels in six sizes from 10 to 20 inch cut. They are also putting on the market a high-traction 10-inch drive wheel machine, under the name of the Chief, made in three sizes, 18, 20 and 24 inch cut. This mower will possess all the merits and improvements embodied in Rowlett's Champion mower.

Terry's Solid Steel Anti-Friction Hanger.

Terry Mfg. Company, Horseheads, N. Y., are introducing a hanger, as illustrated herewith. It consists of one solid piece of steel, thoroughly ribbed, with broad bearings on the door and axle, and has no



Terry's Solid Steel Anti-Friction Hanger.

bolts or rivets to loosen. The perpendicular slot in the plate is for taking out the wheel if it breaks, or if for any other reason it is desirable to do so. The advantages claimed for the hanger are that it is very strong, that the solid steel plate completely covers the wheel excluding snow, ice, chaff or other obstacles from getting on the track, and that the ribbed flanges on the edges of the horizontal slot give increased strength. It is stated by the manufacturers that this hanger possesses the desirable features of other hangers, and has, in addition, many superior points of merit.

Maxwell Automatic Sash Lock.

George A. Maxwell, Wilmington, Del., is introducing a sash lock, as illustrated in Fig. 1. The catch is shown in Fig. 2.



Fig. 1.—Maxwell Automatic Sash Lock.

The spring in Fig. 1, just back of the face plate, allows the slide to automatically engage the catch when the lower sash is closed, thus fastening the lock. The lock for the top sash is worked by means of a small chain, but on the same

effective principle as the one illustrated. It is claimed that this lock possesses extraordinary strength, that it is impossible

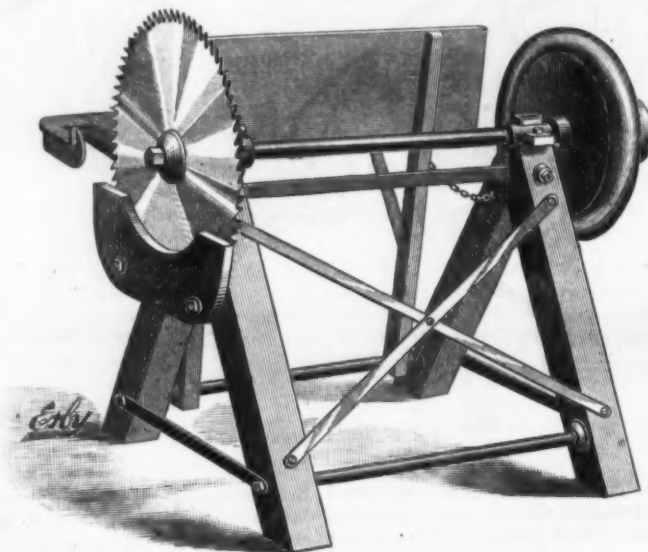


Fig. 2.—Catch Into which the Slide Fastens.

to locate it from the outside and that it is a combined sash fastener and lifter.

The Rochester Saw.

Irving W. Fox, Rochester, Minn., is introducing a saw of the tilting-table type, as illustrated herewith. It is de-



The Rochester Saw.

signed for cutting cord wood, logs and poles. There are steel coil springs to throw the table back, also a hook to fasten the table up and out of the way when

Planet Jr. Eleven-Tooth Harrow, Cultivator and Pulverizer Combined.

S. L. Allen & Co., Philadelphia, Pa., are introducing for the season 1891 a harrow, cultivator and pulverizer combined, as illustrated in Fig. 1. The statement is made that the frame is much higher than usual in this class of tools, and that the blades, 1 inch wide, are of such perfect shape as to work in a thorough and satisfactory manner, offering an unusual amount of wearing surface. The reverse position is given to the teeth, Fig. 2, in a short time by the changing of a bolt. The point is made that the recurved throat and high frame prevent the teeth clogging. The frame is heavy and strong, and the teeth set straight with the line of motion

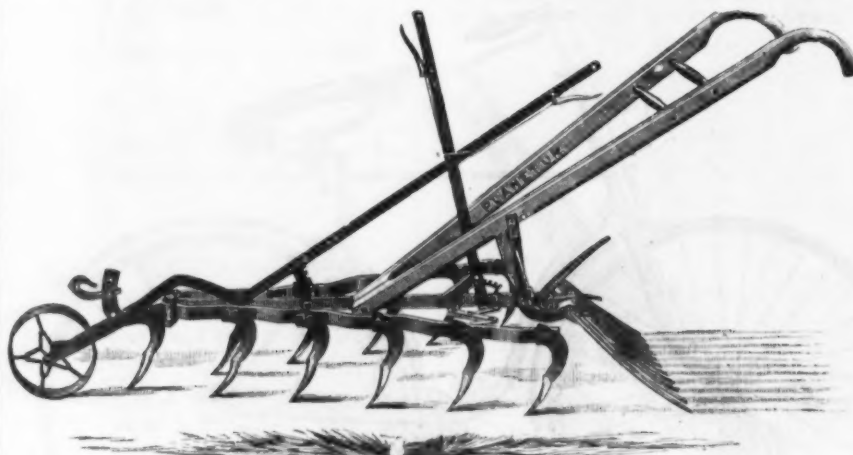


Fig. 1.—Planet Jr. Eleven-Tooth Harrow, Cultivator and Pulverizer Combined.

moving, neither of which are shown in the cut. It also has a pole attachment extending beyond the saw to hold up logs and poles. The frame is referred to as being much stiffer than one made with rise and tenon, moas the bolts extend through the pipe and wood, by the tightening of which the frame may always be kept rigid. The combination iron and wood frame is well bolted together and painted in vermilion. The saws are made in two sizes, A and B. Size A has 1 $\frac{1}{2}$ -inch steel mandrel, 60-pound fly wheel, 5 x 5 inch pulley and a 20-inch saw. Size B has 1 $\frac{3}{4}$ -inch steel mandrel, 100-pound fly wheel, 6 x 6 inch pulley and 24-inch saw.

provided with the '91 lever wheel, and also with a pulverizer attachment. The pulverizer is controlled by a lever, which can be readily operated by the foot while



Fig. 2.—The Planet Jr. Teeth in a Reversed Position.

in motion. The harrow, with the teeth turned backward, is used for trashy ground and leveling and for crops just breaking through the surface. The pulverizer may

be reduced in width by taking off the outside teeth, and the tool may be used to straddle a row, cultivating both sides at once, by taking out the middle teeth of both the cultivator and pulverizer.

Lancaster Drive Sash Pulley.

Slaymaker, Barry & Co., Lancaster, Pa., John H. Graham & Co., 113 Chambers street, New York agents, are introducing

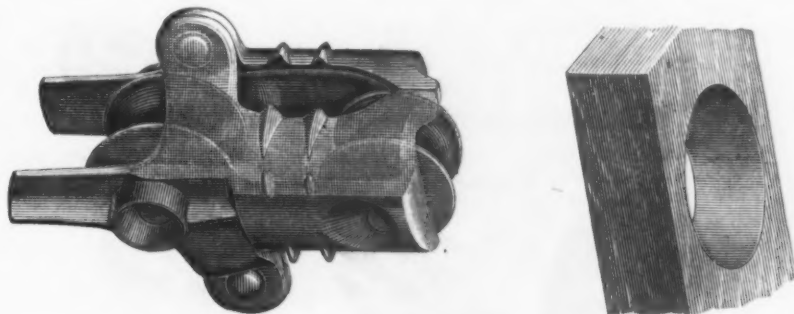


Fig. 1. - Lancaster Drive Sash Pulley.

a sash pulley, as illustrated, Fig. 1. It is composed of a cast case having two pulleys, with the back one at such a distance from the frame as to prevent any rubbing of the sash weight along the sides of the box, Fig. 2. These pulleys are driven into a 1 1/4-inch hole in the window frame, and, it is stated, require no screws or other fastening to keep them in place. They are driven in until the shoulder strikes the solid wood. It is claimed that the projections on the case compel the pulleys to

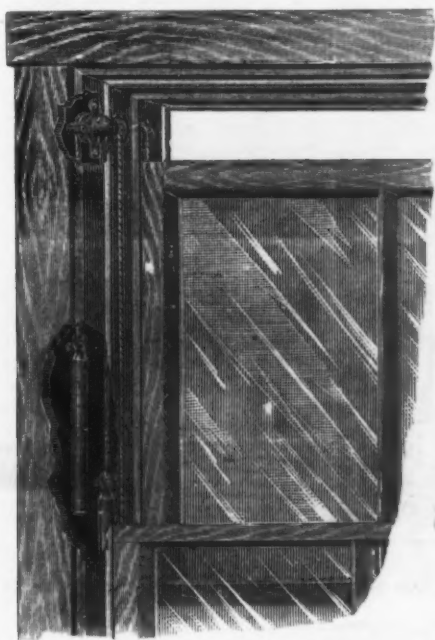


Fig. 2. - Lancaster Sash Pulley in Use.

stay in place under all circumstances, that an everlasting lubricating compound is used on all of the bearings, and that having two rollers in each sash pulley, the sash is much more easily balanced than on pulleys with one roller. Attention is directed to their advertisement in *The Iron Age* of March 5.

Kingery's Perfection Steam Power Roaster.

Kingery Mfg. Company, Cincinnati, Ohio, are putting on the market a steam power roaster, as shown in the accompanying illustration. It is stated that the materials used in its manufacture are the

best brass, copper and galvanized iron. The engine is nickel plated, and the roaster painted and ornamented. The boiler is provided with a glass water gauge, safety valve and steam gauge. The fuel used is gasoline, two burners being used, one for the boiler and one for the roasting cylinder. There is a flame spreader attachment for distributing the flame from the center to each end of the cylinder, designed to get the required amount of heat with a small amount of fuel. They

will be fitted to use gas if so desired. The nuts are kept warm by the escaping steam. The contents of the cylinder may be tested with a tryer, from time to time, without checking the motion, determining in this manner when the roasting is complete. It is claimed that the roaster is so



Kingery's Perfection Steam-Power Roaster.

constructed that it requires no attention while in operation, that it is simple in construction and operation, that it is strongly made, very durable, easily operated, and that it will not get out of order. Two sizes are made. The smallest size will roast fully 1 peck of peanuts or 10 pounds of coffee at one time, and has



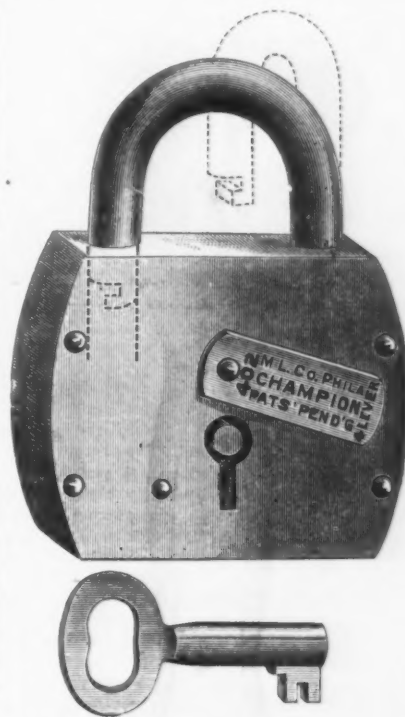
Derby Hair Curler.

a 1/4-bushel warmer. The largest size will roast fully 2 pecks of peanuts or 20 pounds of coffee, and has a 1-bushel warmer. They weigh about 100 pounds each and can be worked in or out of doors,

the shackle flies around automatically, following the dotted lines shown in the cut. The locking is done by turning the shackle to its original position, when the free end drops into its receptacle and fastens itself. The shackle is of a size that adapts the lock to an unusually wide range of service. The weight, 4 1/2 ounces, suits it to baskets, trunks and other portable uses. It is claimed that the four levers afford a degree of security unprecedented in locks of such moderate price. Over 200 changes of key are available when required, and when so ordered they are made so the key can be withdrawn only after locking, at a small advance in price. These goods are made in steel and brass.

An Automatic Padlock.

Miller Lock Company, Frankford, Philadelphia, Pa., are introducing an automatic padlock, of which we give a full-sized illustration. When the key is turned



Automatic Pad Lock.

the shackle flies around automatically, following the dotted lines shown in the cut. The locking is done by turning the shackle to its original position, when the free end drops into its receptacle and fastens itself. The shackle is of a size that adapts the lock to an unusually wide range of service. The weight, 4 1/2 ounces, suits it to baskets, trunks and other portable uses. It is claimed that the four levers afford a degree of security unprecedented in locks of such moderate price. Over 200 changes of key are available when required, and when so ordered they are made so the key can be withdrawn only after locking, at a small advance in price. These goods are made in steel and brass.

The Derby Hair Curler.

Geo. L. Thompson Mfg. Co., 183-187 South Canal street, Chicago, are introducing a hair curler, nickel plated, with polished wood handle, as illustrated herewith. The curler is provided with a heating core, within the tube, which is extended by pressure upon the button at the end of the handle, and is held firmly in position for heating by an automatic stop. By simply reversing the curler the automatic stop is withdrawn, and the heated core returned and held securely within the tube. The manufacturers claim that

the curler is strong and durable, simple in construction, easily operated, and that with ordinary care it will last a lifetime. The point is made that it does not burn or soil the hair or hands.

Perfection Lead-Pipe Cutter.

L. L. Lord, Meadville, Pa., is introducing a pipe cutter, as illustrated herewith. This consists of a pincer shaped device, with roller cutting disks. The manufacturer claims that it cuts quickly and smoothly, making no chips; that it is con-

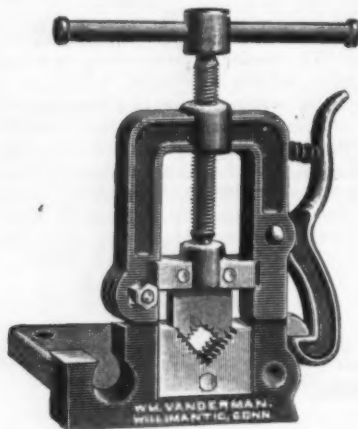


Perfection Lead-Pipe Cutter.

venient to carry and to use; that it will cut lead pipe quicker and more evenly than a saw, and that it obviates any possibility of getting chips into pipes when they are in position, as chips are likely to make trouble when the water is turned on. It is stated that the material and work in its make up are first class, and that the cutters are made from dressed tool steel, which may easily be sharpened on an oil stone or replaced at a trifling cost. It will cut pipe from $\frac{1}{4}$ to $1\frac{1}{2}$ inches, and is finished in japan and nickel.

Vanderman's Pipe Vise, with Bending Forms.

A new form of pipe vise, made with bending forms attached, has just been put on the market by William Vander-



Vanderman's Pipe Vise, with Bending Forms.

man, Willimantic, Conn. This vise, with its hinged frame, was put on the market some time ago, the improvement in the

present instance being the bending forms, which, we understand, will take pipe from $\frac{1}{4}$ to 1 inch in diameter. The two forms as shown in the cut do not interfere in any way with the pipe jaws or the strength of the vise. The form on the left of the vise has a flat surface on top, which may be used as a place to hammer on. The vise itself, which is portable, and has the self-locking feature, is adapted to take pipe from $\frac{1}{4}$ to $2\frac{1}{2}$ inches in diam-

is provided with a tapering flange upon which bears a non-rotating friction washer. Upon this washer, and bearing down upon the flange or stem, the packing is compressed in the usual way by the packing nut. The necessary friction can be brought to bear on the stem, thus preventing displacement of the disks and lever at any desired opening of the valve. Attention is called to the fact that this valve must not be confounded

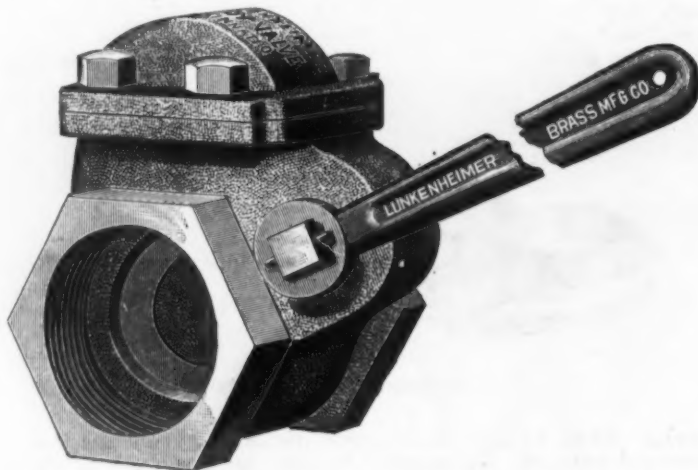


Fig. 1.—Improved Handy Gate Valve.

eter. The manufacturer especially refers to the convenience of the bending attachment, as with its use the fitter can straighten his pipe without having to look around for a hole in the wall, or rig up a temporary upright with a hole in it for the purpose of bending the pipe. He also adds that it is impossible to make a good-looking job unless attention is paid to bending pipe and removing kinks, and this is a very inconvenient work on small

with quick-opening valves used as throttles, for which their special heavy lever throttle valve is designed. The manufacturers claim that this is more compact than the ordinary globe or gate valve and is particularly designed for low pressures, to take the place of gate valves and stop cocks. It is stated that this valve will be found especially adapted for fluids in refineries and oil works; as a tank valve for steam heating and fire extinguish-

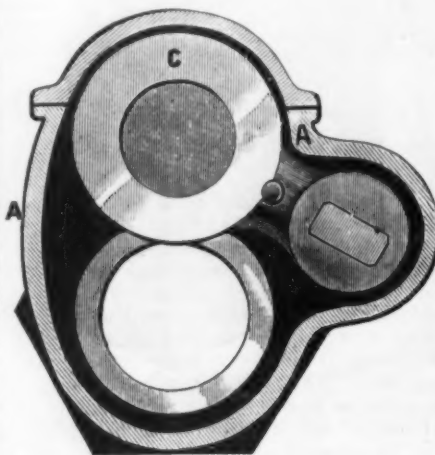


Fig. 3.—Detailed View of the Disks.

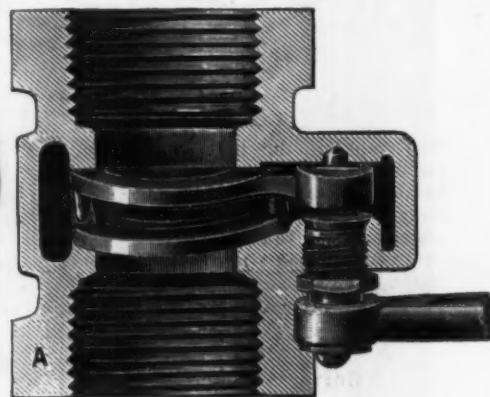


Fig. 2.—The Disks in Connection with the Stem.

jobs, where suitable appliances are not at hand. The total weight of the vise is 18 pounds.

Improved Handy Gate Valve.

The Lunkenheimer Brass Mfg. Company, Cincinnati, Ohio, are putting on the market an improved form of their Handy Gate Valve, as shown in Figs. 1, 2 and 3. This is a double disk straightway valve, operated by a lever instead of a wheel, the position of which indicates the opening of the valve. The disks are secured to the operating stem and adapted to close against tapering seats in the valve shell, and being provided with ball and socket bearings at their back, are evenly wedged against their seats when the valve is closed by the lever. The stem

ing purposes; in fact, wherever a simple, compact and inexpensive straightway valve is wanted. It may be placed near the ceiling and operated by a rod or rope.

Helical Tire Bolt.

Russell & Erwin Mfg. Company, 45 Chambers street, New York, are introduc-



Helical Tire Bolt.

ing a novelty in a spiral tire bolt, as illustrated herewith. The spirals run to the left, or in the opposite direction to the thread, and extend from the head to

the thread. It is claimed for this tire bolt that in driving it into the rim of a wheel the spirals enter or imbed themselves in the wood, thus preventing the bolt from turning when screwing on the nut, rendering it less liable to become loose, and that the spirals increase the strength of the bolt. These are made in all the regular lengths of $\frac{3}{4}$ and $\frac{1}{2}$ inch.

Puritan Egg Poachers.

The Eustis Mfg. Company, 124-128 West Twenty-fourth street, New York, are introducing egg poachers, as illustrated

is referred to as strong and durable, and besides holding files, will answer most of the purposes of a hand vise. It is stated that it will hold perfectly files of all sizes and shape tangs, from a 15-inch mill file to the smallest size in use; and that it will hold equally well twist drills gimlets, screw drivers, auger bits, and all tools with shanks less than $\frac{1}{2}$ inch square.

Steel Fishing Rods.

The Horton Mfg. Company, Bristol, Conn., manufacturers of Bristol Steel Fishing Rods, began this business

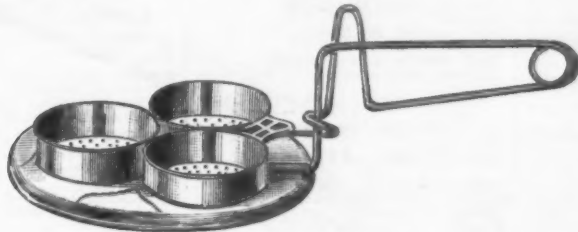


Fig. 1.—Three-Ring Puritan Egg Poacher.

in Figs. 1 and 2. These are substantially made of steel and retinned. To remove eggs from the poacher both branches of the handle are grasped and the hand closed. The rings are thus raised entirely free and clear of the poacher plate, and remain in this position, allowing the eggs to be removed with a knife. It is stated that

three years ago, by putting on the market a fly and bait rod, both of which were telescopic. They have, however, increased their line to such an extent as to compete successfully with bamboo and other rods on the market. They are now making jointed steel rods with outside guides, as well as telescopic rods, and

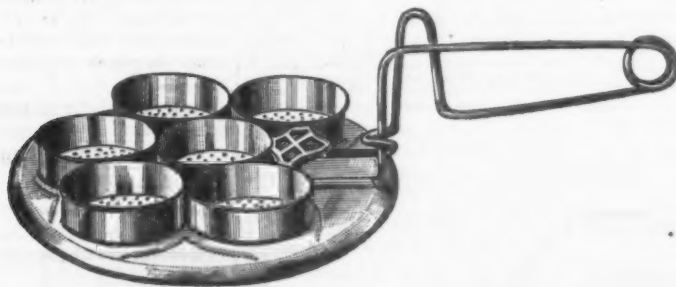


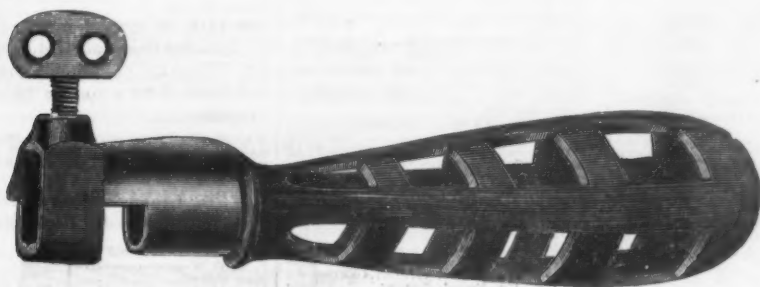
Fig. 2.—Six-Ring Puritan Egg Poacher.

the shape of the bottom plate greatly facilitates removing the eggs without breaking them. The poacher is submerged in a vessel containing sufficient water to cover the rings; the eggs are not dropped into the rings until the water is boiling vigorously. The poachers are made with three and six rings, as shown in the cuts.

Universal File Handle.

Millers Falls Company, 93 Reade street, New York, are introducing a file

have twelve different styles or numbers for the present season. They are putting on the market this year a much better finished rod, in many ways, than they have been able to produce before. They are now using the Favorite two-ring guide on all their jointed rods, and an improved three-ring German silver tip on all the bait rods. Their No. 1 bass rod is 9 feet 6 inches in length, full nickel mounted, with solid reel seat above the hand, the line running through the center of the rod. When telescoped the rod is 32 inches in length, all inclosed within the butt



Universal File Handle.

handle, as illustrated herewith. This is made of malleable iron, 5 inches long, weight 5 ounces, and is finished in Japan, with a thumb screw of forged steel. It

length; weight, 12 $\frac{1}{2}$ ounces. This is made with either plain wood or celluloid wound handle. The jointed rods weigh from 8 to 16 $\frac{1}{2}$ ounces, according to length.

New B. & O. Car Shops.—It is reported that the Baltimore and Ohio Railroad Company have completed negotiations for the purchase of 87 acres of land adjoining their tracks at Cumberland, Md. The property will be used for the erection of mammoth car and repair shops, employing over 1000 men. The repair work for all the lines from Baltimore to Wheeling and Baltimore to Pittsburgh will be done there. The city of Cumberland recently voted \$150,000 to assist in the construction of the shops. The Glenwood shops will be practically abolished as a result of the change. The company will tear down a portion of the buildings for the purpose of increasing the yard facilities. The men employed at the Glenwood shops will locate at Cumberland after the new shops are built. About 400 men are employed at Glenwood.

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CURRENT HARDWARE PRICES.

MARCH 11, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobber, at the figures named.

Adjusters, Blind.

Domestic..... \$ dos \$3.00, 33¢
Excelsior..... \$ dos \$10.00, 50¢
Washburn's Self-Locking..... 30¢

Ammunition.—

Caps, Percussion, W 1000—
Hicks & Goldmark's and Union Metallic
Cartridge Co..... 34¢
F. L. Waterproof, 1-10's..... 34¢
E. B. Trimmed Edge, 1-10's..... 46¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 46¢
Musket Waterproof, 1-10's..... 50¢
G. D..... 28¢
S. B. Genuine Imported..... 46¢
Eley's E. H..... 54¢
Eley's D Waterproof, Central Fire..... \$1.50

Cartridges—

Arm Fire Cartridges..... 50¢
Rim Fire Military..... 15¢
Cent. Fire, Pistol and Rifle..... 25¢
Cent. Fire, Military and Sporting..... 35¢
Blank Cartridges, except 22 and 32 cal.,
additional 10% on above discounts.
Blank Cartridges, 22 cal., \$1.75..... 2¢
Blank Cartridges, 32 cal., \$3.50..... 2¢
Primed Shells and Bullets..... 15¢
B. R. Caps, Round Ball, \$1.75..... 2¢
B. R. Caps, Con. Ball, Swgd., \$2.00..... 2¢

Primers—

Berdan Primers, \$1.00..... 2¢
B. L. Caps (for Sturtevant Shells) \$1.00..... 2¢
All other Primers, \$1.20..... 2¢

Shells—

First quality 4, 8, 10 and 12 gauge..... 25¢
First quality, 14, 16 and 20 gauge (10
list)..... 30¢
Star, Club, Rival and Climax..... 35¢
Selbold's Comb. Shot Shells..... 15¢
Brass Shot Shells, 1st quality..... 60¢
Brass Shot Shells, Club, Rival, Climax..... 65¢

Shells Loaded—

Standard List, July 19, 1890..... 40¢
Wads—Price per M.
U. M. C. & W. R. A.—B. E. 11 up..... 68¢
U. M. C. & W. R. A.—B. E. 8..... 82¢
U. M. C. & W. R. A.—B. E. 7..... 96¢
U. M. C. & W. R. A.—B. E. 6..... 110¢
U. M. C. & W. R. A.—P. E. 11 up..... 115¢
U. M. C. & W. R. A.—P. E. 10..... 150¢
U. M. C. & W. R. A.—P. E. 9..... 170¢
U. M. C. & W. R. A.—P. E. 8..... 180¢
Eley's B. E. 11 up..... \$1.75
Eley's P. E. 11 up..... 2.80

Anvils.—

Eagle Anvils, \$ 10¢..... 15¢
Peter Wright's..... 11¢
Armstrong's Mouse Hole..... 10¢
Armstrong's Mouse Hole, Extra..... 12¢
Trenton..... 10¢
Wilkinson's..... 10¢
Moore & Barnes Mfg. Co..... 35¢

Anvil Vise and Drill—

Millers Falls Co., \$18.00..... 20¢
Cheney Anvil and Vise..... 25¢
Allen Anvil and Vise, \$3.00..... 40¢
Star..... 45¢

Apple Parers—See Parers, Apple.

Augers and Bits—

Douglas Mfg. Co..... 70¢
Wm. A. Ives & Co..... 70¢
Humphreysville Mfg. Co..... 70¢
French, Swift & Co. (P. H. Beecher)..... 70¢
P. S. & W. Co..... 70¢
Rockford Bit Company..... 70¢
Cook's, Douglas Mfg. Co..... 55¢
Cook's, N. H. Copper Co. 50¢
Ives' Circular Lip..... 60¢
Patent Solid Head..... 30¢
C. E. Jennings & Co., No. 10, extension
1P..... 40¢
C. E. Jennings & Co., No. 30..... 40¢
C. E. Jennings & Co., Auger Bits, set,
32¢ quarters, No. 5, 8; No. 30, \$3.50, 20¢
Lewis' Patent Single Twist..... 45¢
Russell Jennings' Augers and Bits 25¢
Imitation Jennings Bits..... 60¢
Snell's Jennings Pattern..... 60¢
Pugh's Black..... 20¢
Rockford, Jennings' Pattern..... 60¢
Car Bits, P. S. & W. Co..... 60¢
Snell's Car Bits..... 60¢
L. Hommedieu Car Bits..... 15¢
Forster's Pat. Auger Bits..... 20¢
Cincinnati Bell-Ringers' Bits..... 30¢

Bit Stock Drills—

Morse Twist Drills..... 50¢
Standard..... 50¢
Cleveland..... 50¢
Syracuse, for metal..... 30¢
Syracuse, for wood (wood list) 30¢
Williams' or Holt's, for metal 50¢
Williams' or Holt's, for wood..... 40¢
Cincinnati, for wood..... 30¢
Cincinnati, for metal..... 45¢

Expansive Bits—

Clark's small, \$18; large, \$26..... 35¢
Ives' No. 4, \$ dos \$60..... 40¢
Swan's..... 40¢
Stern's No. 1, \$25; No. 2, \$22..... 35¢
Stern's No. 3, \$48..... 30¢

Gimlet Bits—

Common..... \$ gross \$2.75 @ \$3.25
Diamond..... \$ dos \$1.10..... 25¢
See..... 25¢
Double Cut, Shephardson's..... 45¢

Double Cut, Ct. Valley Mfg. Co..... 50¢
Double Cut, Hartwell's, \$ gro..... 25¢
Double Cut, Douglas..... 40¢
Double Cut, Ives..... 60¢

Hollow Augers—

Ives..... 33¢
French, Swift & Co..... 33¢
Douglas..... 40¢
Bouney's Adjustable, \$ dos \$48..... 40¢
Stearns'..... 30¢
Ives' Expansive, each \$4.50..... 50¢
Universal Expansive, each \$4.50..... 20¢
Wood's..... 25¢
Cincinnati Adjustable..... 25¢
Cincinnati Standard..... 25¢
Ship Augers and Bits..... 25¢
L. Hommedieu's..... 15¢
Watrous'..... 15¢
Snell's..... 15¢
Snell's Ship Auger Pat'n Car Bits..... 15¢

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common \$ gr \$1.70, 35¢
Awls, Should. Peg, \$ gr \$2.40, 40¢
Awls, Pat. Peg, \$ gr \$3.40, 40¢
Awls, Shouldered Brad, 2.70 \$ gr..... 35¢
Awls, Handled Brad, \$7.50 \$ gr..... 45¢
Awls, Handled Scratch \$ gr, \$7.50, 35¢
Awls, Socket Scratch, \$ dos, \$1.50, 25¢

Awl and Tool Sets—See Sets, Awl and Tool.

Axes— Plain, Beveled.
First quality..... \$8.00, \$8.50
Others..... 7.50, 8.00
Axle Grease—See Grease, Axle.

Axles—

No. 1, 4¢ @ 5¢, No. 2 5¢ @ 6¢
Nos. 7 to 14..... 55¢
Nos. 15 to 18..... 47¢
Nos. 19 to 22..... 70¢
Concord Axles, loose collar..... 5¢
Concord Axles, solid collar..... 6¢
National Tubular Self-Oiling..... 35¢

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances..... 40¢
Chatillon, \$ dos..... \$0.80, 0.95, 1.75
Chatillon Straight Balances..... 40¢
Chatillon Circular Balances..... 50¢

Bars.—

Crow—
Cast Steel..... \$ 3¢
Iron, Steel Points..... \$ 3¢
Basins, Wash—
Standard Fiberglass, No. 1, 10½-Inch, \$2;
12-Inch, \$2.25; 15½-Inch, \$2.75; 16-Inch,
\$3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '83..... 50¢
Chatillon's No. 1..... 40¢
Chatillon's No. 2..... 50¢
Custer's..... 33¢

Beaters—

Egg—
Dover..... \$ dos \$1.50
Duplex (Standard Co.)..... \$ dos \$1.25
Rival (Standard Co.)..... \$ dos \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ dos \$3.50
Bryant's..... \$ gro \$14.00
Double (H. & R. Mfg. Co.) \$ gro, No. 0,
\$12.00; No. 1, \$15.00; No. 2..... \$36.00
Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50
Spiral \$ gro \$4.25 @ \$4.50
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00
Palme, Diehl & Co's..... \$ gro \$24.00
Silver & Co..... \$ dos \$5.50

Culinary—

Keystone, P. D. & C., Each, No. 1, \$1; No. 2,
\$2.

Bells—

Common Wrought..... 60¢
Western..... 20¢
Kentucky, "Star"..... 70¢
Kentucky, Sargent's list..... 70¢
Dodge, Genuine Kentucky..... 70¢
Texas Star..... 50¢
Call..... 40¢
Farm Bells..... \$ 8¢
Steel Alloy Church and School Bells..... 40¢

Door—

Gong, Abbe's..... 35¢
Gong, Yankee..... 45¢
Gong, Barton's..... 40¢
Crank, Taylor's..... 25¢
Crank, Brooks'..... 50¢
Crank, Connel's..... 10¢
Lever, Sargent's..... 60¢
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... 35¢
Lever, R. E. M. Co's..... 50¢
Pull, Brook's..... 50¢
Pull, Western..... 25¢

Electric—

Bigelow & Downe..... 20¢
Taylor's..... 20¢

Hand—

Light Brass..... 75¢
Extra Heavy..... 65¢
White Metal..... 60¢
Silver Chime..... 35¢
Globe Cone's Patent..... 35¢

Bellows—

Blacksmith's..... 60¢
Molders'..... 40¢
Hand Bellows..... 40¢

Belted Rubber—

Common Standard..... 70¢
Standard..... 60¢
Extra..... 50¢
N. Y. B. & P. Co., Carbon..... 60¢
N. Y. B. & P. Co., Diamond..... 50¢
N. Y. B. & P. Co., Para..... 40¢

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..... 15¢
Detroit Perfected Tire Bender..... 15¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889..... 60¢
Cleveland Block Co., Mal. Iron..... 50¢
Moore's Novelty, Mal. Iron..... 50¢

Boards, Stove—

Wood Lined "Crystal"..... 50¢
"Oxidized"..... 50¢
Paper Lined Zinc..... 55¢
"Crystal"..... 55¢
"Embossed"..... 55¢
"Oxidized"..... 45¢

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84..... 75¢
Genuine Eagle, list Oct. '84..... 75¢
Phil. pattern, list Oct. '74..... 80¢
R. B. & W., old list..... 70¢
Machine, list Jan. 1, 1890..... 75¢

Bolt Ends, list Jan. 1, 1890..... 75¢

Cast Iron Barrel, Square, &c. 70¢
Cast Iron Shutter Bolts..... 70¢
Cast Iron Chain (Sargent's list)..... 65¢
Ives' Patent Door Bolts..... 60¢
Wrought Barrel..... 70¢
Wrought Square..... 70¢
Wrt Shutter, all Iron, Stanley's..... 60¢
Wrt Shutter, Brass Knob..... 40¢
Wrt Shutter, Sargent's list..... 55¢
Wrt Sunk Flush, Sargent's list..... 55¢
Wrt Sunk Flush, Stanley's list..... 55¢
Wrt B.K. Flush, Com'n..... 55¢

Stove and Flow—

Stove..... 80¢
R. B. W. Flow..... 60¢
Flow..... 55¢

Tire—

Common, list Feb. 28, '83..... 65¢
Port Chester Bolt and Nut Company:
Empire, list Feb. 28, '83..... 65¢
Keystone, Philadel., list Oct. '84..... 80¢
Norway, Phil., list Oct. '84..... 75¢
American Screw Company:
Norway, Phil., list Oct. 16, '84..... 80¢
Eagle, Phil., list Oct. 16, '84..... 80¢
Philadel., list Oct. 16, '84..... 80¢
Bay State, list Feb. 28, '83..... 65¢
R. B. & W., Philadel., list Oct. 16, '84..... 80¢

Borers, Tap.

Common and Kind..... 20¢
Ives' Tap Borer..... 35¢
Enterprise Mfg. Co..... 30¢
Clark's..... 33¢
Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per B..... 24¢
American Bit Brace Co.:
Nos. 10, 12, 20..... 60¢
Nos. 11, 21, 24, 27..... 70¢
Nos. 22, 25, 28..... 60¢
Nos. 13, 26, 37..... 70¢
Ball Braces, net..... \$1.12 to \$1.25

Amidon's

Barker's Imp'd Plain..... 75¢
Barker's Imp. Nickel..... 65¢
Ratchet..... 75¢
Eclipse Ratchet..... 60¢
Globe Jawed..... 40¢
Corner Brace..... 40¢
Universal, 5 in., \$2.10 10 in..... \$2.25
Buffalo Ball..... \$1.10 @ \$1.15

Barber's

Nos. 10 to 16..... 50¢
Nos. 30 to 35..... 50¢
Nos. 40 to 65..... 60¢

Saxton's

Barker's Imp. Polished..... 75¢
Barker's Imp. Nickel..... 65¢
Ratchet, Polished..... 60¢
Ratchet, Nickel..... 40¢
Buffalo Ball..... net, \$1.10 @ \$1.15

Bartholomew's

Nos. 25, 27 and 30..... 60¢
Nos. 117, 118, 119..... 70¢
Common Ball, American..... \$1.00 @ \$1.10

Fray's

Genuine Spofford's..... 50¢
Fray's No. 70 to 120, 81 to 123, 207 to 415..... 50¢

Ives' New Haven Novelty

New Haven Ratchet..... 60¢
Barber Ratchet..... 60¢
Barbers..... 60¢
Osmond's Ratchet..... 40¢
P. S. & W. Co., Peck's Patent..... 60¢

Brackets—

Shelf plain, Sargent list, 55¢
Shelf, fancy, Sargent's list, 60¢

Reading, plain

Reading, plain..... 50¢
Reading, Rosette..... 60¢
Bright Wire Goods—See Wire.

Broilers—

Hemis Self-Inch..... 9 10 9x11
Basting, Per dos \$4.50 5.50 7.50
New Haven..... 50¢
Wire Goods Co..... 65¢

Buckets, Well.

Galvanized—

Hill's..... \$ dos, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad..... \$ dos, 14 qt, \$4.25 @ \$4.50
Helwig's Flat Iron Band..... \$3.75
Helwig's Wired Top..... \$ dos \$4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—

Brass—

Wrought Brass..... 75¢
Cast Brass, Tiebout's..... 60¢
Cast Brass, Corbin's, Fast..... 35¢
Cast Brass, Loose Joint..... 35¢

Cast Iron—

Fast Joint, Narrow..... 50¢
Fast Joint, Broad..... 50¢
Loose Joint..... 50¢
Loose Joint, Japanned..... 70¢
Loose Joint, Jap. with Acorns..... 70¢
Parliament Butts..... 70¢
Mayer's Hinges..... 45¢
Loose Pin, Acorns..... 45¢
Loose Pin, Acorns, Japanned..... 45¢
Loose Pin, Acorns, Japanned, Plated Tips..... 45¢

Wrought Steel—

Fast Joint, Narrow..... 50¢
Fast Joint, Lt. Narrow..... 50¢
Fast Joint, Broad..... 70¢
Table Butts, Back Flaps, &c..... 75¢
Inside Blind, Regular..... 50¢
Inside Blind, Light..... 50¢
Bronzed Wrought Butts..... 50¢

Calipers—See Compasses.

Calks, Tee—

Gautier, One Prong, Blunt..... 5¢
Burke's, One Prong, Blunt..... 5¢
Burke's, Two Prong, Blunt..... 7¢
Burke's, One Prong, Sharp..... 6¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry..... 10¢
Cotton..... 10¢
Wool..... 10¢

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed..... 55¢
Plate..... 55¢
Shallow Socket..... 40¢
Deep Socket..... 40¢
Yale Casters, list May, 1884..... 30¢
Yale, Gem..... 60¢
Martin's Patent (Phoenix)..... 45¢
Payson's Anti-friction..... 60¢
Giant Truck Casters..... 50¢
Stationary Truck Casters..... 50¢
Socket Truck Casters..... 60¢

Cattle Leaders—See Leaders, Cattle.

Cement.

Victor Elastic..... 5 m pails \$ 5

Chain—

Trace, Wagon and Fancy Chains,
List revised April 21, 1890..... 50¢
American Coil, in cask lots,
3-16 3-16 4-16 5-16 6-16 8-16 10-16 12-16 14-16 16-16 18-16 20-16 22-16 24-16 26-16 28-16 30-16 32-16 34-16 36-16 38-16 40-16 42-16 44-16 46-16 48-16 50-16 52-16 54-16 56-16 58-16 60-16 62-16 64-16 66-16 68-16 70-16 72-16 74-16 76-16 78-16 80-16 82-16 84-16 86-16 88-16 90-16 92-16 94-16 96-16 98-16 100-16 102-16 104-16 106-16 108-16 110-16 112-16 114-16 116-16 118-16 120-16 122-16 124-16 126-16 128-16 130-16 132-16 134-16 136-16 138-16 140-16 142-16 144-16 146-16 148-16 150-16 152-16 154-16 156-16 158-16 160-16 162-16 164-16 166-16 168-16 170-16 172-16 174-16 176-16 178-16 180-16 182-16 184-16 186-16 188-16 190-16 192-16 194-16 196-16 198-16 200-16 202-16 204-16 206-16 208-16 210-16 212-16 214-16 216-16 218-16 220-16 222-16 224-16 226-16 228-16 230-16 232-16 234-16 236-16 238-16 240-16 242-16 244-16 246-16 248-16 250-16 252-16 254-16 256-16 258-16 260-16 262-16 264-16 266-16 268-16 270-16 272-16 274-16 276-16 278-16 280-16 282-16 284-16 286-16 288-16 290-16 292-16 294-16 296-16 298-16 300-16 302-16 304-16 306-16 308-16 310-16 312-16 314-16 316-16 318-16 320-16 322-16 324-16 326-16 328-16 330-16 332-16 334-16 336-16 338-16 340-16 342-16 344-16 346-16 348-16 350-16 352-16 354-16 356-16 358-16 360-16 362-16 364-16 366-16 368-16 370-16

Chucks.

Beach Pat.	each, \$8.00	20%
Morse's Adjustable, each	\$7.00, 20@20.50	
Danbury	each, \$6.00, 30@30.50	
Syracuse, Bala Pat.	each, \$3.50	25%
Graham Patent	each, \$3.50	33%
Skinner's Patent Chucks	each, \$3.50	33%
Combination Lathe Chucks	each, \$3.50	33%
Universal Lathe Chucks	each, \$3.50	40%
Independent Lathe Chucks	each, \$3.50	40%
Drill Chucks	each, \$3.50	10%
Union Mfg. Co.	each, \$8.50	25%
Victor	each, \$8.50	25%
Combination	each, \$8.50	40%
Universal	each, \$8.50	40%
Independent	each, \$8.50	40%

Churns.

Tiffin Union, each, 5 gal.	\$3.25; 7 gal., \$3.75; 10 gal., \$4.25	
McDermid Star Barrel Churn, each,	6 gal., \$2.00; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25	

Clamps.

R. L. Tool Co.'s Wrought Iron	each, \$2.50	
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%
Adjustable, Cincinnati	each, \$1.50	15%

Cleavers.

Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%
Bradley's	each, \$2.50	25%

Clips.

Norway, Axle, 1/2 & 5-16	each, \$5.50	55%
2nd grade Norway Axle, 1/2 & 5-16	each, \$5.50	55%
Superior Axle Clips	each, \$5.50	55%
Norway Spring Bar Clips, 1/2 & 5-16	each, \$5.50	55%
Wrought-Iron Felloe Clips	each, \$5.50	55%
Steel Felloe Clips	each, \$5.50	55%
Baker Axle Clips	each, \$5.50	55%

Cloth and Netting, Wire—See Wire, &c.

Cockeys.

Cocks, Brass.

Hardware list.

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fanc Goods Co.

Embossed, Gilt, Pope & Steven's list

Leather, Pope & Steven's list.

Brass, Pope & Steven's list.

Chapman Mfg. Company.

Combs, Curry.

Fitch's.

Rubber, per doz \$10.00.

Perfect.

Compasses, Dividers, &c.

Compasses, Callipers, Dividers.

Hemls & Call Co's

Dividers

Compasses & Callipers

Wing and Inside or Outside

Double

(Call's Pat. Inside)

Excelsior

J. Stevens & Co's

Starrett's

Spring Callipers and Dividers

Lock Callipers and Dividers

Combination Dividers

Coopers' Tools—See Tools, Coopers'.

Cord

Sash.

Common

Patent, good quality

White Cotton Braided, Fair

Common Russia Sash

Patent

Cable Laid Italian Sash

Indian Cable Laid

Silver Lake

A Quality, White, 50'

B Quality, White, 50'

C Quality, White, 50'

Sylvan Spring, Extra Braided, White, 34'

Sylvan Spring, Extra Braided, White, 34'

Semper Idem, Braided, White, 30'

Egyptian, India Hemp, Braided, 25'

Braided, White Cotton, 50'

Braided, Drab Cotton, 50'

Braided, Italian Hemp, 50'

Braided, Linen, 80'

Tate & Co. Braided Wire, \$100 ft., 54'

Wire Picture.

Braided or Twisted

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut

Table (H. & B. Mfg. Co.)

Blake's Pattern

Turner & Seymour Mfg. Co.

Crucibles

Grain

White Crayons

D. M. Stewart Mfg. Co., Metal Work-

ers, \$2.50

D. M. Stewart Mfg. Co., Rolling Mill,

\$2.50

See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters.

Dixon's #1	each, \$14.00	20%
Dixon's #2	each, \$17.00	20%
Dixon's #3	each, \$19.00	20%
Dixon's #4	each, \$20.00	20%
Woodruff's #1	each, \$15.00	20%
Woodruff's #2	each, \$18.00	20%
Woodruff's #3	each, \$20.00	20%
Woodruff's #4	each, \$22.00	20%
Hales Pattern #1	each, \$27.00	20%
Hales Pattern #2	each, \$33.00	20%
Hales Pattern #3	each, \$38.00	20%
Hales Pattern #4	each, \$45.00	20%
American #1	each, \$5.00	20%
American #2	each, \$7.00	20%
American #3	each, \$10.00	20%
American #4	each, \$12.00	20%
American #5	each, \$15.00	20%
American #6	each, \$18.00	20%
American #7	each, \$22.00	20%
American #8	each, \$25.00	20%
American #9	each, \$30.00	20%
American #10	each, \$35.00	20%
American #11	each, \$40.00	20%
American #12	each, \$45.00	20%
American #13	each, \$50.00	20%
American #14	each, \$55.00	20%
American #15	each, \$60.00	20%
American #16	each, \$65.00	20%
American #17	each, \$70.00	20%
American #18	each, \$75.00	20%
American #19	each, \$80.00	20%
American #20	each, \$85.00	20%
American #21	each, \$90.00	20%
American #22	each, \$95.00	20%
American #23	each, \$100.00	20%
American #24	each, \$105.00	20%
American #25	each, \$110.00	20%
American #26	each, \$115.00	20%
American #27	each, \$120.00	20%
American #28	each, \$125.00	20%
American #29	each, \$130.00	20%
American #30	each, \$135.00	20%
American #31	each, \$140.00	20%
American #32	each, \$145.00	20%
American #33	each, \$150.00	20%
American #34	each, \$155.00	20%
American #35	each, \$160.00	20%
American #36	each, \$165.00	20%
American #37	each, \$170.00	20%
American #38	each, \$175.00	20%
American #39	each, \$180.00	20%
American #40	each, \$185.00	20%
American #41	each, \$190.00	20%
American #42	each, \$195.00	20%
American #43	each, \$200.00	20%
American #44	each, \$205.00	20%
American #45	each, \$210.00	20%
American #46	each, \$215.00	20%
American #47	each, \$220.00	20%
American #48	each, \$225.00	20%
American #49	each, \$230.00	20%
American #50	each, \$235.00	20%
American #51	each, \$240.00	20%
American #52	each, \$245.00	20%
American #53	each, \$250.00	20%
American #54	each, \$255.00	20%
American #55	each, \$260.00	20%
American #56	each, \$265.00	20%
American #57	each, \$270.00	20%
American #58	each, \$275.00	20%
American #59	each, \$280.00	20%
American #60	each, \$285.00	20%
American #61	each, \$290.00	20%
American #62	each, \$295.00	20%
American #63	each, \$300.00	20%
American #64	each, \$305.00	20%
American #65	each, \$310.00	20%
American #66	each, \$315.00	20%
American #67	each, \$320.00	20%
American #68	each, \$325.00	20%
American #69	each, \$330.00	20%
American #70	each, \$335.00	20%
American #71	each, \$340.00	20%
American #72	each, \$345.00	20%
American #73	each, \$350.00	20%
American #74	each, \$355.00	20%
American #75	each, \$360.00	20%
American #76	each, \$365.00	20%
American #77	each, \$370.00	20%
American #78	each, \$375.00	20%
American #79	each, \$380.00	20%
American #80	each, \$385.00	20%
American #81	each, \$390.00	20%
American #82	each, \$395.00	20%
American #83	each, \$400.00	20%
American #84	each, \$405.00	20%
American #85	each, \$410.00	20%
American #86	each, \$415.00	20%
American #87	each, \$420.00	20%
American #88	each, \$425.00	20%
American #89	each, \$430.00	20%
American #90	each, \$435.00	20%
American #91	each, \$440.00	20%
American #92	each, \$445.00	20%
American #93	each, \$450.00	20%
American #94	each, \$455.00	20%
American #95	each, \$460.00	20%
American #96	each, \$465.00	20%
American #97	each, \$470.00	20%
American #98	each, \$475.00	20%
American #99	each, \$480.00	20%
American #100	each, \$485.00	20%

Meat.

Dixon's #1

Dixon's #2

Dixon's #3

Dixon's #4

Woodruff's #1

Woodruff's #2

Woodruff's #3

Woodruff's #4

Hales Pattern #1

Hales Pattern #2

Hales Pattern #3

Hales Pattern #4

American #1

American #2

American #3

American #4

American #5

American #6

American #7

American #8

American #9

American #10

American #11

American #12

American #13

American #14

American #15

American #16

American #17

American #18

American #19

American #20

American #21

American #22

American #23

American #24

American #25

American #26

American #27

American #28

American #29

American #30

American #31

American #32

American #33

American #34

American #35

American #36

American #37

American #38

American #39

American #40

American #41

American #42

American #43

American #44

American #45

American #46

American #47

American #48

American #49

American #50

American #51

American #52

Roggin's Latches..... \$ doz 30¢ to 35¢
Bronze Iron Drop Hatches..... \$ doz 70¢ net
Jap'd Store Door Handles—Nuts, \$1.02;
Plate, \$1.10; No Plate, \$0.88..... net
Barn Door, \$ doz \$1.40..... 10¢10¢
Chest and Lifting..... 70¢

Wood—

Saw and Plane..... 40¢10¢ to 40¢10¢5¢
Hammer, Hatchet, Axe, Sledge, &c..... 40¢
Brad Axl..... \$ gr 2.00
Hickory Firmer Chisel, ass'd..... \$ gr 4.50
Hickory Firmer Chisel, large..... \$ gr 5.00
Apple Firmer Chisel, ass'd..... \$ gr 5.00
Apple Firmer Chisel, large..... \$ gr 5.00
Socket Firmer Chisel, ass'd..... \$ gr 5.00
Socket Framing Chisel, ass'd..... \$ gr 5.00
J. S. Smith & Co.'s File..... 50¢
File, assorted..... \$ gr 2.75
Auger, assorted..... \$ gr 5.00
Auger, large..... \$ gr 7.00
Pat. Auger, Ives..... 30¢10¢
Pat. Auger, Douglass..... \$ set \$1.25
Pat. Auger, Swan's..... \$ set \$1.00
Hoe, Rake, Shovel, &c..... 50¢10¢

Hangers—

Barn Door, old patterns..... 60¢10¢ to 70¢
Barn Door, New England..... 60¢10¢ to 70¢
Samson Steel Anti-Friction..... 55¢
Orleans Steel..... 55¢
Hamilton Wrought Wood Track..... 45¢
U. S. Wood Track..... 45¢
Champion..... 60¢10¢
Rider and Wooster, Medina Mfg. Co.'s
List..... 70¢
Climax Anti-Friction..... 55¢
Climax Anti-Friction for Wood Tracks..... 55¢
Zemlin for Wood Tracks..... 55¢
Reed's Steel Arm..... 50¢
Challenge, Barn Door..... 50¢
Sterling's Imp'vd (Anti-Friction)..... 65¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00..... 50¢25¢
Cherter..... 50¢10¢
Kiddie's..... 50¢10¢
The Boss..... 50¢10¢
Best Anti-Friction..... 60¢10¢
Duplex (Wood Track)..... 60¢10¢5¢
Terry's Pat., \$ doz pr. 4 in, \$10.00; 5 in, \$12.00..... 50¢10¢
Terry's Steel Anti-Friction Leader..... 50¢10¢
Terry's Steel Anti-Friction Ideal..... 50¢10¢
Cronk's Patent Steel Covered..... 50¢5¢
Wood Track Iron Clad, \$ ft. 10¢..... 50¢
Carrier Steel Anti-Friction..... 50¢10¢
Architect, \$ set \$6.00..... 20¢
Belipse..... 20¢10¢
Felix, \$ set \$4.50..... 20¢
Richards..... 20¢10¢
Lane's Standard..... 50¢5¢ to 50¢10¢
Lane's New Standard..... 50¢5¢ to 50¢10¢
Ball Bearing Door Hanger..... 20¢10¢ to 25¢10¢
Warner's Pat..... 20¢10¢ to 20¢10¢
Stearns' Anti-Friction..... 20¢10¢ to 20¢10¢
Stearns' Challenge..... 25¢10¢ to 25¢10¢
Faultless..... 40¢40¢5¢
American, \$ set \$4.00..... 20¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢
Paragon, Nos. 1, 2 and 3..... 40¢10¢
Cincinnati..... 25¢10¢
Paragon, Nos. 5, 6, 7 and 8..... 20¢10¢
Crescent..... 20¢10¢
Nickel Cast Iron..... 50¢
Nickel, Malleable Iron and Steel..... 40¢
Scranton Anti-Friction Single Strap..... 35¢
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 45¢
Star..... 40¢40¢ to 45¢
May..... 50¢5¢ to 50¢10¢
Harr, \$6.00..... 40¢10¢
Intestate..... 50¢
Magic..... 45¢

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's..... 50¢10¢
Hunt's..... 50¢10¢
Hurd's..... 50¢10¢
Mann's..... 50¢10¢
Peck's..... 40¢10¢
Underhill's..... 40¢10¢
Buffalo Hammer Co..... 40¢10¢
Fayette R. Plumb..... 50¢5¢
C. Hammond & Son..... 50¢5¢
Kelly's..... 50¢10¢
Sargent & Co..... 50¢10¢
P. S. & W. Co..... 50¢10¢
Ten Eyck Edge Tool Co..... 10¢
Collins..... 50¢5¢
Schultz, Lohoff & Co..... 50¢5¢

Hay and Straw Knives—See

Knives.

Hinges—

Blind Hinges—

Parker..... 75¢25¢
Palmer..... 50¢5¢ to 50¢10¢
Seymour..... 70¢25¢
Huffer..... 50¢
Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢ to 80¢
Clark's Mortise Gravity..... 60¢
Sargent's, Nos. 1, 3, 5, 11, 15..... 75¢10¢ to 75¢10¢5¢
Sargent's, No. 12..... 77¢10¢ to 77¢10¢
Reading's Gravity..... 75¢10¢ to 75¢10¢5¢
Shepard's..... 75¢10¢
Noiseless..... 75¢10¢
Niagara..... 80¢
Buffalo..... 80¢
Clark's Genuine Pattern..... 80¢
O. S., Lull & Porter..... 75¢10¢
Acme, Lull & Porter..... 75¢
Queen City Reversible..... 70¢10¢ to 75¢
Clark's Lull & Porter, Nos. 0, 1, 11, 2, 3, 4, 5..... 75¢10¢ to 75¢10¢5¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$6.00; No. 3, for Brick, \$11.50..... 10¢
Gate Hinges—
Western..... \$ doz \$4.40, 60¢
N. E..... \$ doz \$7.00, 55¢
N. E. Reversible..... \$ doz \$5.20, 55¢10¢
Clark's, Nos. 1, 2, 3..... 60¢10¢5¢
Y. Y. State..... \$ doz \$5.00, 55¢10¢
Automatic..... \$ doz \$12.50, 50¢
Common Sense..... \$ doz pair \$4.50, 50¢
Seymour's..... 45¢10¢
Shepard's..... 60¢10¢5¢
Reed's Latch and Hinges..... \$ doz \$12.00, 50¢
Spring Hinges—
Union Spring and Blank Butts..... 40¢
Gear's Spring Hinge Co.'s list, March 1890..... 35¢

Acme..... 30¢
J. S..... 25¢10¢
Empire and Crown..... 20¢
Hero and Monarch..... 55¢
American, Gem, and Star..... 20¢
Oxford..... 20¢
Barker's Double Acting..... 25¢
Union Mfg. Co..... 25¢
Bommer's..... 30¢
Suckman's..... 15¢ to 20¢
Chicago..... 30¢
Wiles..... 10¢
Devore's..... 40¢
Rex..... 40¢
Royal..... 60¢
Reliable..... 60¢
Champion..... 60¢
Bardley's Patents..... 40¢
Stearns..... 50¢10¢
Niagara, Holdback pattern, per gross..... \$14.00

Wrought Iron Hinges

List February 14, 1891.
Corrugated Strap and T..... 50¢10¢
Screw Hook and..... 14 to 20 in, \$ 3.44
Strap..... 22 to 36 in, \$ 3.44
Screw Hook and Eye..... 14 in, \$ 3.44
36 in, \$ 4.44

Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢
Rolled Blind Hinges, Nos. 232 and 234..... 50¢10¢
Rolled Plate..... 70¢10¢
Rolled Raised..... 70¢10¢
Plate Hinges (8, 10 & 12 in, \$ 3.44
"Providence" over 12 in, \$ 4.44

Hoes—

Eye—

D. & H. Scovill..... 20¢
Lane's Crescent Planters Pattern..... 45¢5¢
Lane's Razor Blade, Scovill Pattern..... 30¢
Maynard, S. & O. Pat..... 45¢5¢
Sandusky Tool Co., S. & O. Pat..... 50¢10¢5¢
Am. Axe and Tool Co., S. & O. Pat..... 50¢
Chattanooga Tool Co., S. & O. Pat..... 50¢10¢
Grub..... 60¢10¢

Handled—

Garden, Mortar, &c..... 65¢5¢ to 65¢10¢
Planter's, Cotton &c..... 65¢5¢ to 65¢10¢
Warren Hoe..... 60¢
Magic..... \$ doz \$4.00

Hog Rings and Rings—See

Rings and Rings.

Hoisting Apparatus—See

Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.
Sprenkle's Pat..... \$ doz \$18..... 60¢
Bit.
Extension..... 40¢40¢ to 40¢10¢
Barber's, \$ doz \$15.00..... 40¢40¢ to 40¢10¢
Ives, \$ doz \$20.00..... 60¢5¢ to 60¢10¢
Diagonal..... \$ doz \$24.00, 40¢
Angular..... \$ doz \$24.00, 40¢5¢

File and Tool—

Bals Pat..... \$ doz \$4.00, 25¢
Nicholson File Holders..... 20¢
Dick's Tool Holder..... 30¢

Hooks—

Cast Iron—
Bird Cage, Sargent's list..... 60¢10¢ to 60¢10¢
Clothes Line, Sargent's list..... 60¢10¢ to 60¢10¢
Clothes Line, Reading list..... 55¢10¢ to 55¢10¢
Harness, Reading list..... 55¢10¢ to 55¢10¢
Coat and Hat, Sargent's list..... 55¢10¢ to 55¢10¢
Coat and Hat, Reading..... 50¢10¢ to 50¢10¢
Wrought Iron—
Cotton..... \$ doz \$1.25
Cotton Pat. (N.Y. Mallet & Handle Wks.)..... 30¢
Tassel and Picture (T. & S. Mfg. Co.)..... 50¢
Wrought Staples, Hoes, &c..... 50¢
See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886..... 50¢
Wire Coat and Hat, Miles, list April, 1886..... 50¢
Indestructible Coat and Hat..... 45¢
Wire Coat and Hat, Standard..... 60¢
Steady Hat and Coat..... 50¢10¢
Steady Ceiling Hooks..... 50¢10¢
Belt..... 80¢ to 80¢10¢
Atlas, Coat and Hat..... 60¢

Miscellaneous.

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
Nolin's Grass..... \$ doz \$2.25
Bush..... 65¢60¢
Whiffletree—Patent..... 55¢
Hooks and Eyes—Malleable Iron..... 70¢ to 70¢10¢
Hooks and Eyes—Brass..... 60¢10¢ to 60¢10¢
Fish Hooks, American..... 50¢
Bench Hooks..... See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition..... 75¢ to 75¢5¢
Standard..... 60¢10¢ to 60¢10¢5¢
Extra..... 40¢10¢ to 40¢10¢5¢
N. Y. B. & P. Co., Para..... 25¢5¢
N. Y. B. & P. Co., Extra..... 40¢10¢ to 40¢10¢5¢
N. Y. B. & P. Co., Dundee..... 40¢10¢ to 40¢10¢5¢

Huskers—

Blair's Adjustable..... \$ gr \$5.00
Blair's Adjustable Clipper..... \$ gr 7.00
Hubbard's Solid Steel..... \$ gr 4.50

Indurated Fiber-Ware—See

Ware, Indurated Fiber—

Irons.

Sad—

From 4 to 10, at factory..... \$ 100 2
Self-Heating..... \$ doz \$9.00 to \$2.40
Self-Heating, Tailors'..... \$ doz \$18.00 net
Mrs. Pott's Irons..... 50¢5¢
Enterprise Star Irons..... 50¢5¢
XX Cold Handle Sad Irons..... 50¢5¢

Ideal Irons new list..... 50¢10¢ to 50¢10¢5¢
Salamander, irons..... 25¢
B. B. Sad Irons, \$ doz..... 30¢34¢
Combined Fluter and Sad Iron, \$ doz..... 15¢
Fox Reversible, Self-Fluter \$ doz \$24.00
Chinese Laundry (N.E. Butt Co.) \$ doz..... 15¢
New England..... 25¢
Mahony's Troy Pot. Irons..... 50¢10¢5¢
Sensible, list Jan. 91..... 50¢10¢5¢
Sensible Tailor's Irons..... 33¢5¢
National Self-Heating..... 30¢

Soldering—

Soldering Coppers..... \$ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886..... 35¢25¢

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..... 33¢44¢
Victor..... 33¢44¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..... 50¢5¢
Brass, Spun, Plain, W.M. list Jan. 1, '91..... 25¢
Enameled and Tea—See Hollow Ware.

Keys—

Lock Ass'n list Dec. 30, 1886..... 50¢10¢
Eagle, Cabinet, &c..... 33¢44¢
Hotchkiss' Brass Hanks..... 40¢
Hotchkiss' Copper and Tinned..... 40¢
Hotchkiss' Pad. and Cab..... \$ doz \$4.50, 15¢
Ratchet Bed Keys..... 50¢10¢
Wollensak Tinned..... 50¢10¢

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—
Wilson's Butcher Knives, list Oct. 1, 1890..... 25¢
Ames' Butcher Knives..... 25¢
Foster Bros' Butcher, &c..... 40¢
Jordan's AAA1, Butcher's, list..... 40¢
Nichols' Butcher Knives..... 40¢10¢
W. W. Wilson, Butcher, 6 in, \$2.00; 7 in, \$2.70; 8 in, \$3.50, &c..... 20¢25¢
Ames' Bread Knives, \$ doz \$1.50, 15¢ to 20¢
Moran's Shoe and Bread..... 20¢
Hay and Straw..... See Hay Knives.
Table and Pocket..... See Cutlery.
Corn, Auburn Mfg. Co. Western Pat..... \$2.00

Corn—

Bradley's..... 10¢
Wadsworth's..... 25¢

Drawing—

Witherby..... }
P. S. & W..... } 75¢ to 75¢10¢
Mix..... }
New Haven..... }
Merrill..... 60¢10¢ to 60¢10¢5¢
Deuch..... 75¢ to 75¢5¢
Watrous..... 15¢10¢ to 25¢
L. & J. White..... 20¢5¢
Bradley's..... 35¢
Adjustable Handle..... 25¢33¢44¢
Wilkinson's Folding..... 25¢33¢44¢

Hay and Straw—

Lightning, Mfrs' price \$ doz \$18.00, 25¢
But jobbers cut this price freely,
often selling at \$8 @ \$5.50.
Wadsworth's..... 40¢75¢ to 40¢10¢
Sargent's Needle..... \$ doz \$11.50
Heath's..... \$ doz \$13.00 to \$13.50
Auburn Hay, Com. and Spear Point..... 50¢
Auburn Straw..... 40¢
Nolin's Hay..... \$ doz \$7.00 @ \$8.00

Mfrs'.

Am. 2d quality, \$ gr, 1 blade, \$7;
2 blades, \$12; 3 blades, \$18..... net
Lithrop's..... 20¢10¢
Smith's, \$ doz, Single, \$2.00; Double, \$3..... 40¢45¢
Knapp & Cowles..... 50¢10¢ to 60¢
Buffalo Adjustable..... \$ doz \$3.00, 25¢
Buffalo Double Adjustable..... \$ doz \$3.00, 25¢

Knobs—

Door Mineral..... 60¢65¢
Door Por. Jap'd..... 70¢75¢
Door Por. Nickel..... 32¢00¢ to 22¢
Door Por. Plated, Nickel..... 32¢00¢ to 22¢
Drawer, Porcelain..... 60¢10¢ to 60¢10¢5¢
Hemacite Door Knobs..... 40¢10¢ to 50¢
Yale & Towne Wood, list Dec., 1886..... 40¢
Furniture, Plain..... 75¢ gr inch, 10¢
Furniture, Wood Screws..... 35¢10¢
Base, Rubber Tip..... 70¢10¢5¢
Picture, Judd's..... 60¢10¢ to 70¢
Picture, Sargent's..... 70¢10¢
Picture, Hemacite..... 35¢5¢
Shutter, Porcelain..... 65¢10¢
Carriage, Jap..... \$ gr 80¢, 60¢10¢
Bardley's Wood Door, Shutter, &c..... 40¢

Lades—

Melting, Sargent's..... 55¢10¢
Melting, Reading..... 35¢10¢
Melting, Monroe's Pat..... \$ doz \$4.00, 40¢
Melting, P. S. & W..... 35¢10¢ to 40¢
Melting, Warner's..... 30¢

Lanterns—

Tubular
Plain with Guards, \$ doz..... \$3.75
Lift Wire, with Guards..... \$4.00
Square Plain, with Guards..... \$3.75
Sq. Lift Wire, with Guards..... \$4.50

Police Lanterns (including packages).

2 1/2-inch Bull's-eye Police regular..... \$ doz \$3.80
2-inch Bull's-eye Police regular..... \$ doz \$3.80
2 1/2-inch Bull's-eye Police flash light..... \$ doz \$4.00
2-inch Bull's-eye Police flash light..... \$ doz \$4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason, Beckley & Co.'s..... 70¢
Sargent's..... 60¢5¢ to 60¢10¢
Hotchkiss..... 30¢
Peck, Stow & W. Co..... 60¢10¢

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronze Iron..... 50¢
Class 3 and 4, Bronze Metal..... 50¢
Class 3 and 4, Brass..... 35¢
Sightlight Lifters..... 35¢
Crown, Eagle and Shield..... 50¢
Rehner's, list Feb. 20, 1891..... 50¢10¢ to 50¢10¢5¢
Bronze Iron Rods..... 50¢10¢ to 50¢10¢5¢
Brass, Real Bronze or Nickel Plate..... 30¢

Excelsior..... 50¢10¢ to 50¢10¢5¢
Shaw's..... 50¢10¢
Payson's:
Universal..... 60¢
Solid Grip..... 60¢
Imperial..... 50¢10¢

Lines—

Cotton and Linen Fish, Draper's..... 50¢
Draper's and Tate's Chalk..... 60¢
Draper's Mason's Linen, 54 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25..... 25¢
Cotton Chalk..... 60¢
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50..... 40¢

Silver Lake, Braided, No. 30, No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 \$ gr..... 30¢
Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50..... 45¢
Mason's Colored Cotton..... 45¢
Wire Clothes, No. 100 ft..... \$4.00 \$3.50 \$3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..... \$ doz \$7.50, 20¢

Locks, &c.—

Cabinet—
Eagle, Gaylor Par..... list March '84, rev. Jan. '85, 39¢44¢
Delta, Nos. 36 to 39..... 40¢
Delta, Nos. 51 to 63..... 40¢10¢
Delta, Nos. 80 to 96..... 30¢
Stoddard Lock Co..... 20¢33¢44¢
"Champion" Night Latches..... 40¢
Barnes Mfg. Co..... 40¢40¢10¢
Eagle and Corbin Trunk..... 25¢35¢
"Champion" Cab. and Comb..... 33¢44¢
Yale..... net prices
Romer's..... 25¢

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889..... 65¢10¢ to 70¢
Mallory, Wheeler & Co., list July, '88..... lower net prices often made.
Sargent & Co., list Aug. 2, '88.....
Reading Hardware Co., list Feb. 2, '88.....
Brittan, Graham & Mathes, list Jan. 1890..... 60¢10¢ to 60¢10¢5¢
Perkins' Burglar Proof..... 60¢25¢
Barnes Mfg. Co..... 40¢40¢10¢
Yale..... net prices
Delta Flat Key..... 30¢
L. & C. Round Key Latches..... 30¢10¢
L. & C. Flat Key Latches..... 33¢44¢10¢
Romer's Night Latches..... 15¢
Shepardson or U. S..... 35¢
Seed's N. Y. Hasp Lock..... 35¢

Padlocks—

List Dec. 23, '84..... 75¢10¢
Brittan, Graham & Mathes..... 75¢10¢
Yale Lock Mfg. Co.'s..... net prices
Eagle..... 25¢35¢
Eureka, Eagle Lock Co..... 40¢25¢
Romer's, Nos. 0 to 91..... 30¢
Romer's Scandinavian, &c., Nos. 100 to 505..... 15¢
A. E. Delta..... 40¢
Champion Padlocks..... 40¢
Hotchkiss..... 40¢
Horseshoe..... 45¢
Barnes Mfg. Co..... 40¢40¢10¢
Nock's..... 30¢
Brown's Pat..... 25¢
Scandinavian..... 90¢90¢10¢
E. T. Framm's Keystone Scandinavian, Nos. 119, 120, 130 and 140..... 60¢10¢
Other No. 119, 120, 130, 140..... 65¢
Ames Sword Co. up to No. 150..... 40¢
Ames Sword Co. above No. 150..... 60¢
Slaymaker Barry & Co.
No. 1010 line..... 35¢5¢
No. 41 line..... 45¢10¢
No. 61 line..... 50¢5¢
No. 21 line..... 75¢

Snaps, &c.

Clark's, No. 1, \$10; No. 2, \$3 \$ gr..... 33¢44¢
Ferguson's..... 35¢44¢
Morris and Triumph, list Aug. 16, 1886..... 60¢25¢
Victor..... 60¢10¢ to 60¢10¢5¢
Walker's..... 10¢
Atwell Mfg. Co..... 25¢33¢44¢
Reading..... 60¢10¢ to 60¢10¢5¢
Hammond's Window Springs..... 40¢
Common Sense, Jap'd, Cop'd and Br'd..... \$ gr \$4.00
Common Sense, Nickel Plated..... \$ gr \$10.00

Universal

Kempshall's Gravity..... 60¢
Kempshall's Model..... 60¢60¢10¢
Corbin's Daisy, list Feb. 15, 1888..... 70¢
Payson's Perfect..... 60¢60¢10¢
Hugunin's Sash Balances..... 25¢5¢ to 25¢5¢5¢
Hugunin's New Sash Locks..... 25¢5¢ to 25¢5¢5¢
Stoddard "Practical"..... 10¢
Ives' Patent..... 60¢10¢ to 60¢10¢5¢
Liesche's, Nos. 109 and 110, \$ gr \$5; 105, \$10.00..... 30¢10¢
Davis, Bronze, Barnes Mfg. Co..... 50¢
Champion Safety, list March 1, 1888..... 65¢5¢5¢
Security..... 70¢
Buckeye..... \$ gr \$4.50

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles..... \$ doz, \$1.75; \$ gross..... \$17.00

Machines.

Boring—
Without
Augers, Upright, Angular.
Douglas..... \$5.50 \$6.75 \$7.50 \$8.10 \$10.10
Well's, Mace's Pat..... 6.75 \$4.00 \$10.10
Jennings..... 5.50 6.75 4.50 \$4.50 \$10.10
Other Machines..... 2.35 2.75.....
Phillips' Patent with Augers..... 7.00 7.50.....

Fluting.

Knox, 4 1/2-inch Rolls..... \$3.25 each } 35¢
Knox, 6-inch Rolls..... \$3.50 each } 35¢
Eagle, 3 1/2-inch Roll, \$2..... 35¢
Eagle, 5 1/2-inch Roll, \$2.50..... 35¢
Crown, 4 1/2 in, \$2.50; 5 in, \$4.00; 6 in, \$5.00 each..... 35¢
Crown Jewel, 6 in..... \$3.50 each, 35¢
American, 5 in, \$3.00; 6 in, \$3.40; 7 in, \$4.50 each..... 35¢
Domestic Fluter..... each, \$1.50
General Hand Fluter, White Metal..... \$ doz \$12, 25¢
Crown Hand Fluter, Nos. 1, \$15.00; \$12.50; 2, \$10.00..... 30¢
Shepard Hand Fluter, No. 55 \$ doz 15 50..... 40¢

Shepard Hand Fluter, No. 110 # dos \$11.00.....40%
 Shepard Hand Fluter, No. 95 # dos \$8.00.....40%
 Clark's Hand Fluter # dos \$15.00.....35%
 Combined Fluter and Sad Iron, # dos \$15.00.....30%
 Buffalo # dos \$10.00.....10%

Hoisting—
 Moore's Hand Hoist, with Lock 30%
 Brake.....40%
 Moore's Differential Pulley Block.....40%
 Energy Mfg. Co.'s.....25%

Washing—
 Anthony Wayne, # dos No. 1, \$51; No. 2, \$45; No. 3, \$42.

Nails.
 Hickory.....30%10%20%10%10%
 Lignumvite.....30%10%20%10%10%
 B. & L. Mook Co., Hickory & L. V. 30%30%10%

Mattocks, Regular List. 60%10%60%10%35%

Measures—
 Standard Fiberglass, No. 1, peck, # dosen, \$4; 1/2 peck, \$3.50.

Meat Cutters—See Cutters, Meat Mills.

Coffee—
 Box and Side, List Jan. 1, 1888.....60%25%
 American, Enterprise Mfg Co. 30%10%30%
 The Swift, Lane Bros.....30%10%

Mining Knives—See Knives, Mining.

Mellasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
 Pennsylvania New & Model, Excelsior, (continental, &c).....60%60%5%
 Philadelphia.....60%10%
 Other Machines.....60%10%60%70%

Muzzles—
 Safety.....# dos, \$3.00, 25%

Nails.

Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association list, July 15, '89.....75%10%
 Tack Mfrs' list.....70%
 Wire Nails, Standard Penny.
 Card June 1, '89, base.....\$2.35 @ \$2.50
 Horse-See Trade Report.
 No. 1.....25%25%25%25%25%
 Ausable.....25%25%25%25%25%

Clinton, Fin. 19% 17% 16% 15% 14%.....30%
Essex.....25%25%25%25%25%

Lyra.....19% 17% 16% 15% 14%.....30%
Snowden 19% 17% 16% 15% 14%.....30%
Putnam.....25%25%25%25%25%

Vulcan.....25%25%25%25%25%
Northwestern 25% 25% 25% 25% 25%.....30%

Globe.....25%25%25%25%25%

Boston.....25%25%25%25%25%

A. C......25%25%25%25%25%

C. H. K......25%25%25%25%25%

Maud S......25%25%25%25%25%

Champion.....25%25%25%25%25%

New Haven.....25%25%25%25%25%

Saranac.....25%25%25%25%25%

Champion.....25%25%25%25%25%

Capewell.....25%25%25%25%25%

Star.....25%25%25%25%25%

Anchor.....25%25%25%25%25%

Western.....25%25%25%25%25%

Empire.....25%25%25%25%25%

Picture.....25%25%25%25%25%

Brass Head, Sargent's list.....50%10%10%
Brass Head, Combination list.....50%10%
Porcelain Head, Sargent's list.....50%10%10%
Porcelain Head, Combination list.....50%10%
Niles' Patent.....40%

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Hot Pressed.....5.40% 6.00% off list.
Cold Punched.....5.00% 5.10% off list.
 In packages of 100 #, add 1-10% # # #
 net; in packages less than 100 #, add 1/2 # # #, net.

Oakum—
 Government.....# 7 @ 7 1/4
 U. S. Navy.....# 8 @ 8 1/4
 Navy.....# 9 @ 9 1/4

Oilers—
 Zinc and Tin.....65%10%70%
 Brass and Copper.....50%10%50%10%50%
 Malleable, Hammers, Improved, No. 1, \$3.80; No. 2, \$4.00; No. 3, \$4.40 # dos 10%10%25%
 Malleable, Hammers, Old Pattern, same list.....40%
 Prior's Pat. or "Paragon" Zinc.....60%10%10%
 Prior's Pat. or "Paragon" Brass.....50%
 Olmstead's Tin and Zinc.....50%
 Olmstead's Brass and Copper.....50%
 Broughton's Zinc.....60%
 Broughton's Brass.....60%
 Gem P. D. & Co.....# gro. \$2
 Steel, Draper and Williams.....50%

Openers, Can.

Messenger's Comet.....# dos \$3.00, 25%
American.....# gro \$3.00
Duplex.....# dos 25% 15%20%
Lyman's.....# dos \$3.75, 20%
No. 4 French.....# dos \$2.25, 55%60%
No. 5, Iron Handle.....# gr \$6.00, 45%50%
Eureka.....# dos \$2.50, 10%
Sardine Sclissors.....# dos \$3.75 @ \$3.00
Star.....# dos \$3.75
Sprague, No. 1, \$3.00 2, \$2.50 3, \$2.50 50%10%15%
Excelsior No. 1 \$2.50; No. 2, \$1.50.....40%

World's Best, # gross, No. 1, \$13.00 No. 2, \$9.00; No. 3, \$36.00.....60%10%
 Universal, # dos \$3.00.....55%5%
 Domestic, # dos \$2.50.....45%
 Champion # dos \$2.00.....54%

Packing, Steam—

Rubber—
 Standard.....60%5%65%
 Extra.....50%50%55%
 N. Y. B. & P. Co., Standard.....50%
 N. Y. B. & P. Co., Empire.....60%
 N. Y. B. & P. Co., Salamander.....25%
 Jenkins' Standard, # 80#,.....25%25%5%

Miscellaneous—
 American Packing.....10%11% # 2
 Russia Packing.....14% # 2
 Italian Packing.....13%14% # 2
 Cotton Packing.....15%17% # 2
 Jute.....7%5% # 2

Padlocks—See Locks.

Pails.

Galvanized Iron—
 Quarts 10 12 14
 Hill's Light Weight, # dos, \$2.75 3.00 3.25
 Hill's Heavy Weight, # dos, 3.00 3.25 3.75
 Helwig's.....2.50 2.75 3.00
 Sidney Shepard & Co.....3.25 3.50 3.00
 Iron Clad.....2.50 2.75 3.00
 Fire Buckets.....2.75 3.25 3.50
 Buckets, See Well Buckets.

Indurated Fibre Ware—25%
 Star Pails, 12 qt.....# dos \$0.00
 Fire, Stable and Milk, 14 qt.....# dos \$7.50

Standard Fibre Ware—
 Plain, Decr'd
 Water Pails, 12 qt., per doz.....\$4.00 \$4.50
 Dairy Pails, 14 qt., per doz, 4.50 5.00
 Fire Pails, No. 1, 12 qt. per doz, 4.50 5.00
 Fire Pails, No. 2, 14 qt. per doz, 5.00 5.50
 Sugar Pails.....6.00 6.50
 Horse Pails.....5.00
 Buggy Pails.....4.00
 Slop Jars (bal. trap).....8.00 9.00
 Chamber Pails, 14 qt.....6.50 7.50

Pans.

Dripping.
 Small sizes.....# 2 6 1/4
 Large sizes.....# 2 5 1/4
 Silver & Co. (Covered).....40%

Fry—
 Standard List:
 No. 1.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No. 2.....5 6 7 8
 # dos.....\$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....70%10%
 Acme Fry Pans.....60%10%

Dust—
 Steel Edge, No. 1.....# dos \$1.75

Paper and Cloth—
 Sand and Emery—
 List April 19, 1886.....50%50%10%
 Sibley's Emery and Crocus Cloth.....80%

Parers.

Apple.
 Advance.....# dos \$4.75
 Baidin.....# dos 5.25
 Bonanza.....each 5.00
 Champion.....# dos 7.35
 Daisy.....each 4.00
 Dandy.....each 7.50
 Sureka, 1888.....each 13.00
 Family Bay State.....# dos 5.00
 Favorite.....# dos 5.25
 Gem.....# dos 4.00
 Gold Medal.....# dos 4.00
 Ideal.....# dos 4.00
 Improved Bay State.....# dos \$7.00 @ \$9.00
 Little Star.....# dos 4.50
 Monarch.....# dos 5.50
 New Lightning.....# dos 4.00
 Oriole.....# dos 4.00
 Penn.....# dos 4.00
 Perfection.....# dos 4.00
 Pomona.....# dos 4.00
 Rocking Table.....# dos 6.00
 Turntable.....# dos 13.50
 Victor.....# dos 4.00
 White Mountain.....# dos 4.00
 73.....# dos 4.25
 76.....# dos 5.75
 78.....# dos 6.50

Potato—
 White Mountain.....# dos \$4.50
 Antrim Combination.....# dos \$5.50
 Hoosier.....# dos \$1.50
 Saratoga.....# dos \$5.50

Pencils—
 Faber's Carpenters'.....high list 50%
 Faber's Round Gilt.....# gro \$5.25
 Dixon's Lead.....# gro \$4.50
 Dixon's Lumber.....# gro \$0.75
 Dixon's Carpenters'.....40%10%

Picks—
 Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60%10%60%10%5%

Picture Nails—See Nails, Picture.

Pinking Irons—See Irons, Pinking.

Pins.

Row—
 Humason, Beckley & Co.'s.....60%10%
 Sargent & Co.'s.....\$17 and \$18.....60%10%
 Peck, Stow & W Co., 50%10%50%10%5%

Curtain—
 Silvered Glass.....net
 White Enamel.....net

Scutcheon.
 Iron, list Nov. 11, 1885.....50%10%50%10%5%
 Brass.....60%60%

Pipe, Wrought Iron—
 List September 18, 1889.
 1 1/2 and under, Plain.....47%5%
 1 1/2 and under, Galvanized.....40%
 1 1/2 and over, Plain.....40%
 1 1/2 and over, Galvanized.....47%5%
 Boiler Tubes, Iron, all sizes.....50%

Planes and Plane Irons—

Wood Planes—
 Molding.....30%25%
 Bench, First Quality.....45%25%
 Bench, Second Quality.....50%25%
 Bailey's (Stanley R. & L. Co.).....40%10%

Iron Planes—
 Bailey's (Stanley R. & L. Co.).....40%10%40%10%10%
 Miscellaneous Planes (Stanley R. & L. Co.).....30%10%20%10%10%
 Victor Planes (Stanley R. & L. Co.).....30%10%20%10%10%

Steel's Iron Planes—
 Meriden Mfg. Co.'s.....40%40%10%
 Davis's Iron Planes.....40%40%10%
 Birmingham Plane Co.....50%50%10%
 Gage Tool Co.'s Self-Setting.....30%10%10%
 Chaplin's Iron Planes.....40%40%10%
 Sargent's.....30%10%30%10%10%
 Standard Tool Co.....50%50%5%

Plane Irons—
 Butcher's.....\$5.00 @ \$5.25 to \$2
 Buck Bros.....30%
 Auburn "Thistle".....35%25%
 Sandusky.....25%
 S. & L. J. White.....25%

Plates.
 Fellow.....# 2 6 @ 6 1/4

Pliers and Nippers—
 Button's Patent.....50%50%10%
 Hall's No. 2, 5 in. \$13.50; No. 4, 7 in. \$21.00 # dos.....20%10%33%
 Humason & Beckley Mfg. Co.....50%50%10%
 Lindsay's Giant.....40%
 Gas Pliers.....60%
 Gas Pliers, Custer's Nickel Plated.....60%5%
 Eureka Pliers and Nippers.....40%
 Russell's Parallel.....25%
 P. S. & W. Cast Steel.....50%
 P. S. & W. Tinner's Cutting Nippers.....25%
 Carey's Pat. Wire Cutters.....20%
 Morrill's Parallel, # dos, \$12.00.....30%5%
 Cronk's 8 in., \$15.00; 10 in. \$21.00.....40%40%5%

Plumbs and Levels—
 Regular List.....70%10%70%10%10%
 Diston's.....50%
 Pocket Levels.....70%10%70%10%10%
 Davis Iron Levels.....30%
 Davis' Inclinoimeters.....10%10%

Pouchers.

Buff.
 Buffalo Steam Egg Poachers, # dos, No. 1, \$6.00; No. 2, \$9.00.....25%
 Silver & Co., 6-Ring, # dos \$4; 3-Ring \$2

Pokes, Animal—
 Bishop's, X. L.....# dos \$6.00
 Bishop's O. K.....# dos \$5.25
 Bishop's Pioneer.....# dos \$3.75
 Bishop's American.....# dos \$2.75
 Eagle, Double Stale.....# dos \$5.75
 Eagle, Single Stale.....# dos \$3.75
 Buckeye, Single Stale.....# dos \$3.75

Police Goods.
 R. I. Tool Co., Handcuffs, \$15.00 # dos 10%
 R. I. Tool Co., Leg Irons, \$25.00 # dos 10%
 Tower's.....25%
 Daley's Improved Handcuffs, 2 Hands, Polished, # dos \$4.00; Nicklelaid, # dos \$7.00; 3 Hands, Polished, # dos \$7.00; Nicklelaid, \$8.40.....25%
 J. P. Lovell's Police Goods.....25%

Polish, Metal.
 Prestoline.....30%
 Prestoline Paste.....33%
 Gaston's Solvent Compound.....33%

Polish, Stove.
 Joseph Dixon's.....# gro \$6.00, 10%
 Gem.....# gro \$4.50, 10%
 Gold Medal.....# gro \$6.00, 25%
 Mirror.....# pro \$6.00, 10%
 Lustr.....# gro \$4.75
 Ruby.....# gro \$3.75
 Rising Sun.....# gro \$5.50
 Dixon's Plumbago.....# gro \$8
 Boynton's Noon Day, # gro.....13.00
 Parlor Pride Stove Enamel.....# gro
 Yates' Liquid, 2 3 5 10 gal.....# gal.....\$0.50 \$0.70 \$0.50

Yates Standard Paste Polish, 10 b cans. # 12 1/2 # 12 1/2 # 12 1/2
Jet Black.....# gro \$3.50
Japanese.....# gro \$3.50
Firealide.....# gro \$2.50
Diamond O. K. Enamel.....# gro \$19.00
Bonnell's Liquid Stove Polish.....# gro \$9.00
Bonnell's Paste Stove Polish.....# gro \$6.00
Black Eagle Benzine Paste, 5 and 10 b cans.....12 1/2 # 12 1/2 # 12 1/2
Black Jack Water Paste, 5 and 10 b cans.....12 1/2 # 12 1/2 # 12 1/2
Nickel Plate Paste.....# gro \$6.00
Crown Paste.....# gro \$7.50
Crown Paste, in 5 and 10 b pails.....# 12 1/2 # 12 1/2 # 12 1/2
Black Flag.....# gro \$7.50
Black Flag, 5 and 10 b pails.....# 12 1/2 # 12 1/2 # 12 1/2
Black Flag, liquid, in bottles.....# gro \$8.00

Poppers, Corn—
 Round or Square, 1 qt. # gr \$10.00 @ 10.50
 Round or Square, 1 1/2 qt. # gr \$15 @ 15.50
 Round or Square, 2 qt. # gr \$18.50 @ 19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
 Tinned.....40%
 Enamelled.....40%5%
 Family, L. F. C.'s "Handy".....50%

Presses.

Fruit and Jelly—
 Enterprise Mfg. Co.....30%10%30%
 Henis.....# dos \$3.50
 Shepard's Queen City.....40%
 Silver & Co.....# dos \$2.75

Pruning Hooks and Shears—
 See Shears.

Pullers.

Nail.
 Seranton.....# dos \$18.00, 83%
 Curtis Hammer.....# dos \$9.00
 Giant, No. 1.....# dos \$13.00, 10%
 Giant, No. 2.....# dos \$15.00, 10%
 Pelican.....# dos \$9.00, 25%

Pulleys—
 Hot House, Awning, &c.....60%10%
 Japanned Screw.....60%10%
 Japanned Sigs.....60%10%
 Japanned Clothes Line.....60%10%
 Empire Sash Pulley.....55%60%
 Moore's Sash, Anti-Friction.....50%
 Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50.....50%10%50%10%5%
 Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70.....50%
 Hay Fork, "Anti-Friction," 5 in. Wheel, \$13.00.....40%

Pumps—
 Clatern, Best Makers.....60%60%10%
 Pitcher Spout, Best Makers.....67%70%
 Pitcher Spout, Cheaper Goods.....70%70%5%

Punches—
 Saddlers' or Drive, good, # dos.....60%65%
 Bemis & Call Co.'s Cast Steel Drive.....50%5%
 Bemis & Call Co.'s Spring Steel Socket.....50%5%
 Spring, good quality.....# dos \$5.50 @ 6.00
 Spring, Leach's Pat.....15%
 Bemis & Call Co.'s Spring and Check.....40%
 Solid Tinner's P. S. & W. Co. # dos \$1.44, 55%
 Tinner's Hollow Punches P. S. & W. Co. 20%25%
 Rice Hand Punches.....15%
 Avery's Revolving.....40%
 Avery's Saw-Set and Punch, See Saw Set.

Rail—
 Sliding Door, Wrt Brass, # 354.....15%
 Sliding Door, Bronzed Wrt Iron, # ft. 70
 Sliding Door, Iron, Painted, # foot 44, 40%
 Barn Door Light In.....# 3 1/4
 Per 100 feet.....\$2.00 2.50 3.10, 10%
 B. D. for N. E. Hangers.....

Small. Med. Large.
 Per 100 feet.....\$2.15 2.70 3.25, not

**Terry's Steel Rail, # foot.....45%
 Victor Track Rail, # foot.....50%5%
 Carrier Steel Rail, # foot.....45%
 Moore's Wrought Iron.....25%**

Rakes—
 Cast Steel, Association goods.....65%70%
 Cast Steel, outside goods.....60%10%10%70%5%
 Malleable.....70%70%5%
 Gibbs Lawn Rake.....\$12.00, 50%
 Canton Lawn Rake.....\$9.00, 50%10%
 Ft. Madison Prize Bow Brace and Peerless.....65%
 Fort Madison Steel Tooth Lawn Rake, \$6.00.....25%

Razors—
 J. R. Torrey Razor Co.....30%
 Wostenholme and Butcher, \$10.00 to \$15.00.....40%
 Jordan's A.A.L. list Nov. 1, 1889.....50%
 Jordan's Old Faithful, list Nov. 1, '89, 50%
 Galvanic.....# dos \$15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
 Union Nut Co.....55%
 Sargent's.....65%10%70%5%
 Hotchkiss' low list.....30%
 Humason, Beckley & Co.'s.....70%10%
 Peck, Stow & W. Co.'s.....50%10%10%
 Elrich Hdw. Co., White Metal, low list.....50%50%10%

Hog—
 Top of the Hill Ringers.....# dos \$2.00
 Top of the Hill Ringers.....# dos \$1.25
 Hill's Improved Ringers.....# dos \$1.25
 Hill's Old Style Ringers.....# dos \$1.25
 Hill's Tonga.....# dos \$1.25
 Hill's Rings.....# dos bxs \$1.00
 Perfect Rings.....# dos bxs \$1.50
 Perfect Rings.....# dos \$2.15 @ 2.25
 Blair's Hog Ringers.....# dos \$2.00
 Blair's Hog Ringers.....# dos \$2.00
 Champion Rings, Double.....# dos \$2.00
 Brown's Ringers.....# dos \$2.00
 Brown's Ringers.....# dos \$1.15 @ 1.25
 Electric Hog R'ngs.....# dos boxes \$1.50
 Electric Hog Ringers.....# dos \$3.00

Rivets and Hurrs—
 Iron, list Nov. 17, '87.....40%
 Copper.....50%50%10%
 Coppered Iron, Best Brand.....40%

Rivet Sets—See Sets.

Rods.
 Stair, Brass.....25%25%
 Stair, Black Walnut.....# dos 40%

Rollers.

Barn Door, Sargent's list.....60%10%10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope.

Manila, 1/4 in. and larger.....# 11 1/2 # 1

Atkins' Circular Shingle and Heading
dis 50%
Atkins' Silver Steel Diamond X Cuts
foot 70%
Atkins' Special Steel Dexter X Cuts
foot 50%
Atkins' Special Steel Diamond X Cuts
foot 35%
Atkins' Champion and Electric Tooth
X Cuts..... foot 20%
Atkins' Hollow Back X Cuts..... foot 20%
Atkins' Mulay, Mill and Drag..... 40%
Atkins' One-Man Saw, with handles,
foot 40%
Peace Circular and Mill..... 45%
Peace Hand Panel and Rip..... 25%
Peace Cross Cuts..... 45%
Richardson's Circular and Mill..... 45%
Richardson's X Cuts..... 45%
Richardson's Hand, &c..... 25%
C. E. Jennings & Co., Hand, Panel
and Rip..... 25%
Hack Saws—
Griffin's, complete..... 40% to 50%
Griffin's Hack Saw, Blades..... 40% to 50%
Star Hack Saws and Blades..... 25%
Eureka and Crescent..... 25%
Scroll—
Lester, complete, \$10.00..... 25%
Rogers, complete, \$4.00..... 25%
Barnes' Builders' and Cabinet Makers',
\$15..... 25%
Barnes' Scroll Saw Blades..... 35%
Saw Frames—See Frames, Saw.
Saw Sets—See Sets, Saw.
Saw Tools—See Tools, Saw.
Scales—
Hatch, Counter, No. 171, good quality,
foot 21.00
Hatch, Tea, No. 161..... foot 21.00
Union Platform, Plain..... foot 21.00
Union Platform, Striped..... foot 21.00
Chattillon's Grocers' Trip Scales..... 25%
Chattillon's Eureka..... 25%
Chattillon's Favorite..... 40%
Family, Turnbulla..... 30% to 40%
Riehle Bros.' Platform..... 40%
Scale Beams—See Beams, Scale
Scissors, Fluting..... 45%
Scrapers—
Adjustable Box Scraper (B. R. & L. Co.)
\$6.50..... foot 10%
Box, 2 Hand..... foot 10%
Box, 2 Hand..... foot 10%
Defiance Box and Ship..... foot 10%
Foot..... foot 10%
Ship, Common..... foot 10%
Ship, R. I. Tool Co..... foot 10%
Screen Window and Door
Frames—See Frames.
Screw Drivers—See Drivers, Screw.
Screws.
Bench and Hand—
Bench, Iron..... 55% to 55% to 10%
Bench, Wood, Beech..... foot 25%
Bench, Wood, Hickory..... foot 25%
Hand, Wood..... 25% to 10% to 10%
Lag, Blunt Point, List Jan. 1, 1890, 75% to 10%
Coach and Lag, Gimlet Point, List Jan.
1, 1890..... 75% to 10% to 10%
Bed..... 25% to 10%
Hand Rail, Sargent's..... 60% to 10%
Hand Rail, H. & F. Mfg. Co., 70% to 10%
Hand Rail, Am. Screw Co., 75%
Jack Screws, Millers Falls List, 50% to 10%
Jack Screws, P. S. & W., 35%
Jack Screws Sargent's, 60% to 10% to 10%
Jack Screws Stearns', 40% to 10% to 10%
Cork—
Humason & Beckley Mfg. Co., 40% to 10% to 10%
Williamson's, 35% to 10% to 10%
Hows Bros. & Hulbert, 35%
Machine—
Flat Head, Iron..... 55%
Round Head, Iron..... 50%
Wood—
List January 1, 1891.
Flat Head Iron..... 75%
Round Head Iron..... 75%
Flat Head Brass..... 75%
Round Head Brass..... 75%
Flat Head Bronze..... 75%
Round Head Bronze..... 75%
Rogers' Drive Screws..... 85%
Scroll Saws—See Saws, Scroll.
Scythes.
Grain..... 40% to 10% to 10%
Grass..... 40% to 10% to 10%
Scythe Snaths—See Snaths, Scythe.
Sets.
Anti and Tool.
Aiken's Sets, Aylis and Tools,
No. 20, foot 10.00..... 55% to 10%
Fray's Adj. Tool Hdl., Nos. 1, 112, 2, 118;
3, 112; 4, 118..... 35% to 10% to 10%
Miller's Falls Adj. Tool Hdl.,
Nos. 1, 112, 2, 118..... 35% to 10% to 10%
Henry's Combination Haft..... foot 25%
Brad Sets,
No. 42, \$10.50; No. 43, \$12.50, 70% to 10% to 10%
Stanley's Excelsior;
No. 1, \$7.50; No. 2, \$4.00; No. 3,
\$5.50..... 30% to 10% to 10%
Nail—
Square..... foot 4.00 to 4.25
Round..... foot 3.25
Buck Bros..... 27%
Cannon's Diamond Point..... foot 12, 20%
Rivet.
Regular list..... 50% to 10%
Saw—
Stillman's Genuine..... foot 5.00 to 7.75,
40% to 10%
Stillman's Imite..... foot 3.25 to 5.25,
40% to 10% to 10%
Common Lever..... foot 2.00, 40% to 10%
Morrell's No. 1, \$16.00; No. 2, \$24.00,
40% to 10% to 10%
Leach's, No. 0, \$3.99; No. 1, \$15, 15% to 10%
ash's..... 80% to 10% to 10%

Hammer, Hotchkiss..... \$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.
80% to 10%
Bemis & Call Co.'s Lever and Spring
Hammer..... 30% to 10%
Bemis & Call Co.'s Plate..... 10%
Bemis & Call Co.'s Cross Cut..... 12%
Aiken's Genuine..... \$13.00, 50% to 10%
Aiken's Imitation..... \$7.00, 55% to 10%
Hart's Pat. Lever..... 20%
Dixon's Star..... 25%
Leopold..... 40% to 10% to 10%
Atkins' Lever..... foot 10, 1, 60.00
Atkins' Criterion..... foot 10, 1, 60.00
Croissant (Keller) No. 1, \$15.00; No. 2,
\$24.00..... 40% to 10%
Avery's Saw Set and Punch..... 50%
Chieftain H. R. Co.'s Superior..... foot 15, 50%
Sharpeners, Knife.
Parkins.
Applewood Handles..... foot 6.00, 40%
Rosewood or Cocobolo..... foot 9.00, 40%
Shaves, Spoke.
Iron..... 45%
Wood..... 30%
Bailey's (Stanley R. & L. Co.)..... 30% to 10%
Stearns..... 30% to 10%
Cincinnati..... 25% to 10%
Shears—
American (Cast) Iron..... 75% to 10% to 10%
Barnard's Lamp Trimmers..... foot 20, 25%
Timmers..... 20% to 10%
Seymour's, List, Dec., 1881,
60% to 10% to 10% to 10%
Heinrich's, List, Dec., 1881,
60% to 10% to 10% to 10%
Heinrich's Tailor's Shears..... 55%
First quality C. S. Trimmers..... 80% to 10%
Second quality C. S. Trimmers..... 80% to 10% to 10%
Acme Cast Shears..... 10% to 10%
Diamond Cast Shears..... 10%
Clipper..... 10% to 10%
Victor Cast Shears..... 75% to 10% to 10%
Hows Bros. & Hulbert, Solid Forged
Steel..... 40%
Chicago Drop Forge & F. Co., Solid
Steel Forged..... 60%
Clausen Shear Co., Japaned..... 70%
Clausen Shear Co., Nickel-plated, same list, 60%
Galvanic, 3/4 to 1 in., foot 1.00, 1 inch
Pruning Shears and Hooks.
Dixon's Combined Pruning Hook and
Saw..... foot 15.00, 50% to 10%
Dixon's Pruning Hook..... foot 12.00,
20% to 10%
E. S. Lee & Co.'s Pruning Tools..... 40%
Pruning Shears, Henry's Pat., foot 20,
\$3.75, 40%
Henry's Pruning Shears, foot 24, 25%
Wheeler, M. & C. Co.'s Combination,
foot 12.00, 20%
Dunlap's Saw and Chisel, foot 8.50, 30%
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25
P. S. & W. Co..... 60%
Timmers, &c.—
Shears and Snips (P. S. & W.), 80% to 10%
Snips, J. Mallinson & Co., 35%
Sheaves—
Sliding Door—
M. W. Co., List July, 1888, 50% to 10% to 10%
R. & E., List Dec. 15, 1888, 55% to 10%
Corbin's List..... 60% to 10% to 10%
Patent Roller..... 60% to 10% to 10%
Patent Roller, Hatfield's..... 75%
Russell's Anti-Friction, List Dec. 15,
1888, 60% to 10%
Moore's Anti-Friction..... 50%
Sliding Shutter—
R. & E., List Dec. 15, 1888, 60% to 10% to 10%
Sargent's list..... 60% to 10% to 10%
Reading list..... 60% to 10% to 10%
Ship Tools—
L. & J. White..... 20% to 10%
Shoes, Horse, Mule, &c.—
Horse—
Burdens', Perkins', Phoenix, at factory,
\$1.00
Mule—
Add \$1 per keg to above prices.
Or, Wrought—
Ton lots..... foot 9
1000 lb lots..... foot 9
500 lb lots..... foot 10%
Shot—
Ton lots Small lots
Drop, up 'o BB, 25-b bag, \$1.32..... 1.37
Drop, up to BB, 5-b bag..... .35
Drop, BB and larger, 25-b..... 1.57
Drop, BB and larger, 5-b..... .41
Buck and Chilled, 25-b bag 1.57..... 1.62
Buck and Chilled, 5-b bag 1.57..... .41
Dust Shot, 25-b bag..... 2.00
Dust Shot, 5-b bag..... .45
Shovels and Spades—
Ames' Shovels, Spades, &c., List Nov. 1,
1888..... 30%
NOTE.—Jobbers frequently give 5% to 10%
extra on above.
Griffith's Black Iron..... 60% to 10%
Griffith's C. S..... 60% to 10% to 10%
Griffith's Solid C. S. R. R. Goods..... 30%
St. Louis Shovel Co..... 30% to 10% to 10%
Hussey, Binns & Co..... 15% to 10%
Hubbard & Co..... 30% to 10% to 10%
Lehigh Mfg. Co..... 50% to 10%
H. M. Myers Co..... 30% to 10%
Payne Petebone & Son..... 35% to 10%
Remington's (Lowman's) Pat. 30% to 10% to 10%
Rowland's, Black Iron..... 50% to 10%
Rowland's Steel..... 60% to 10% to 10%
Shovels and Tongs—
Iron Head..... 60% to 10% to 10%
Brass Head..... 60% to 10% to 10%
Sieves—
Mann's Tin Rim..... 50% to 10%
Buffalo Metallic, B. & Co..... 50% to 10%
Shaker (Barber's Pat.) Flour Sifters.....
foot 22.00, foot 31.00
Electric..... foot 31.00
A. & W. Sifters..... foot 22.00
Hunter's..... foot 22.00
Smith's Adjustable Sifters..... foot 22.00

Smith's Adjustable Milk Strainer..... foot 22.00
Smith's Adjustable T. & C. Strainer.....
foot 1.25
Shoes, Wooden Rim—
Mesh 18, Nested, foot 80, \$1.00
Mesh 30, Nested, foot 95, 1.10
Mesh 24, Nested, foot 1.15, 1.25
Skis, Thimble—
Western list..... 75% to 10% to 10%
Columbus Wrt. Steel, Special net price—
Coldbrook Iron Co..... 60%
Seneca Falls Pattern..... 60%
Utica P. & T. Skis..... 60%
Utica Turned and Fitted..... 35%
Slates—
School, by case..... 50% to 10% to 10% to 10%
Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.)..... 65%
Fitch's (Bristol)..... 50% to 10%
Hotchkiss..... 10%
Andrews..... 50%
Sargent's Patent Guarded..... 70% to 10% to 10%
Governor, new list..... 40%
Cover, New Patent..... 50% to 10%
Cover, New R. E..... 60% to 10%
Covered Spring..... 60% to 10% to 10%
Snaths, Scythe.
List..... 50% to 10% to 10% to 10%
Soldering Irons—See Irons, Solder-
ing.
Spittoons, Cuspidors, &c.
Standard Fibreware—
Cuspidors, 5/4-inch, foot 2, No. 5, \$8;
No. 2, \$4
Spittoons, Daisy, 5-inch, No. 1, \$4; 10
and 11 inch, \$6.
Spoke Shaves—See Shaves, Spoke.
Spoke Trimmers—See Trimmers,
Spoke.
Spoons and Forks—
Tinned Iron—
Roasting, Cen. Stamp. Co.'s list..... 70% to 10%
Solid Table and Tea, Cen. Stamp. Co.'s
list..... 70% to 10%
Buffalo S. & Co..... 35% to 10%
Silver-Plated—(4 mos. or 5 cash 30
days.)
Meriden Brit. Co., Rogers..... 40% to 10%
Rogers & Bros..... 40% to 10%
Reed & Barton..... 40% to 10%
Wm. Rogers Mfg. Co..... 40, 15% to 10%
Simpson, Hall, Miller & Co., 40, 15% to 10%
Holmes & Edwards Silver Co., 40, 15% to 10%
L. Boardman & Son..... 50% to 10% to 10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver..... 50% to 10% to 10%
No. 30 Silver Metal..... 50% to 10% to 10%
No. 24 German Silver..... 50% to 10% to 10%
No. 50 Nickel Silver..... 50% to 10% to 10%
No. 49 Nickel Silver..... 50% to 10% to 10%
Wm. Rogers Mfg. Co..... 50% to 10% to 10%
Rogers' Silver Metal..... 50, 10% to 10%
18% Rogers' German Silver..... 60% to 10%
25% Rogers' Nickel Silver..... 50% to 10%
German Silver..... 50% to 10% to 10%
German Silver, Hall & Elton, 50% to 10% cash
Nickel Silver..... 50% to 10% to 10% cash
Boardman's N. C. Silver 40% to 10% cash
Boardman's Britannia Spoons, case
lots..... 60% to 10% to 10% cash
Spring—
Door—
Torrey's Rod, regular size..... foot 1.30
Gray's, 7/8 gr., \$20.00..... 20%
See Rod 7/8 gr., \$20.00..... 20%
Warner's No. 1, foot 22, No. 2,
\$18..... 40% to 10% to 10%
Gem (Coll), List April 19, 1886..... 10%
Star (Coll), List April 19, 1886..... 30%
Victor (Coll)..... 60% to 10% to 10%
Champion (Coll)..... 60% to 10% to 10%
Philadelphia, 5 in., \$5.00; 5 in., \$7.75, \$
15.00..... No. 1, foot 15.00; No. 2,
\$15.00..... 20%
Rubber, complete, foot 4.50, 55% to 10%
Hercules..... 50%
Shaw Door Check and Spring, 35% to 10% to 10%
Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Rail
Scroll..... 60% to 10% to 10%
Cliff's Bolster Springs..... 25%
Squares—
Steel and Iron..... } 80% to 10%
Nickel-Plated..... }
Try Square and T Bevels..... 60% to 10% to 10%
Diston's Try Square and T Bevels..... 50%
Waterbottom's Try and Miter..... 30% to 10%
Starrett's Micrometer Caliper Squares.....
25%
Avery's Flush Bevel Squares..... 40%
Avery's Bevel Protractor..... 50%
Squeezers.
Fodder—
Blair's..... foot 22.00
Blair's "Climax"..... foot 1.25
Lemon—
Porcelain Lined, No. 1..... foot 20.00,
25% to 10%
Wood, No. 2..... foot 23.00, 35%
Wood, Common..... foot 1.70, 1.75
Dunlap's Improved..... foot 3.75, 30%
Samuels..... No. 1, \$5.00; No. 2, \$6; 12,
\$18..... 25% to 10%
Jennings' Sizer..... foot 22.50
The Boss..... foot 22.50
Dean's, Nos. 1, foot 20.00; 2, \$3.35; 3,
\$1.90; Queen, \$2.50
Little Giant..... 50% to 10% to 10%
King..... 40% to 10% to 10%
Hotchkiss Straight Flash..... foot 12.00
Silver & Co., Glass..... foot 22.00
Standard Fibre Ware—See Ware,
Standard Fiber.
Staples.
Blind—
Barbed, in. and larger..... foot 7, 7%
Barbed, 1/2 in.,..... foot 8, 8%
Fence staples, Galvanized, Same price
Fence Staples, Plain..... as Brb Wire.
See Trd. Rep.
Steelyards..... 40% to 10% to 10%
Stocks and Dies—
Blacksmith's
Waterford Goods..... 40% to 10% to 10%
Butterfield's Goods..... 40% to 10% to 10%
Lightning Screw Plate..... 35% to 10%
Reece's New Screw Plates..... 35% to 10% to 10%
Reversible Ratchet..... 30%
Gardner..... 25%
Stops, Bench.
Morrell's..... foot 20, 50%
Hotchkiss's..... foot 20, 50% to 10% to 10%
Weston's, No. 1, \$10; No. 2, \$9.25, 50% to 10% to 10%
McGill's..... foot 20, 10%
Cincinnati..... 25% to 10% to 10%
Stone—
Hindustan No. 1, 3/4; Aze, 3/4; Slips
No. 1, 4 1/4
Sand Stone..... foot 2 1/4
Washita Stone, Extra..... foot 20, 21%
Washita Stone, No. 2..... foot 15, 16%
Washita Stone, No. 3..... foot 11, 12%
Washita Slips, No. 1, Extra..... foot 37, 40%
Washita Slips, No. 1..... foot 25, 26%
Arkansas Stone, No. 1, 4 to 6 in, \$1.50
Arkansas Stone, No. 1, 6 to 9 in, \$1.35
Turkey Oil Stone, 4 to 8 in..... foot 40%
Turkey Slips..... foot 1, 10%
Lake Superior, Chamois..... foot 31, 32%
Seneca Stone, Red Paper Brand..... foot 18, 20%
Seneca Stone, High Rounds..... foot 20, 25%
Seneca Stone, Small Whets..... foot 24, 20%
Stove Polish—See Polish, Stove.
Stretchers, Carpet.
Cast Steel, Polished..... foot 23, 22%
Cast Iron, Steel Points..... foot 20, 20%
Socket..... foot 17, 15%
Villard's..... 25% to 10% to 10%
Straps, Razor—
Genuine Emerson..... 60% to 10% to 10%
Imitation..... foot 22.00, 20% to 10% to 10%
Torrey's..... foot 20, 20%
Ladger's Belt and Com..... foot 23.00
Lamont Combination..... foot 24.00
Jordan's Pat. Padded, List Nov. 1, 89, 50%
Electric..... List net
Stuffers or Fillers, Sausage—
Miles' "Challenge," foot 20, 50% to 10% to 10%
Perry..... foot 20, 15.00; No. 0,
\$11.00..... 50% to 10% to 10%
Draw Cut No. 4, each \$20.00..... 30%
Enterprise Mfg. Co..... 20% to 10% to 10%
Silver's..... 40% to 10%
Sweepers, Carpet.
Bissell No. 5..... foot 17.00
Bissell No. 7 New Drop Pan..... foot 19.00
Bissell, Grand..... foot 33.00
Grand Rapids..... foot 24.00
Crown Jewel, No. 1, \$18.00; No. 2,
\$19.00; No. 3, \$20.00
Magic..... foot 15.00
Jewel..... foot 17.00
Improved Parlor Queen..... foot 27.00
Nickel..... foot 22.00
Janned..... foot 22.00
Excelsior..... foot 22.00
Garland..... foot 18.00
Parlor Queen..... foot 24.00
Housewife's Delight..... foot 18.00
Queen..... foot 16.00
Queen, with band..... foot 18.00
King..... foot 30.00
Weed, Improved..... foot 18.00
Hub..... foot 16.00
Cog-Wheel..... foot 16.00
Conqueror..... foot 22.00
Easy..... foot 22.00
Monarch..... foot 22.00
Goshen..... foot 21.00
Tacks, Brads, &c.—
List Oct. 19, 1889, Standard Weights.
Carpet Tacks—
American Iron, Blued..... 77%
Am'can Iron, Tin'd or Cop'd, 77%
Steel, Plain or Bright..... 75%
Steel, Tinned or Coppered..... 75%
Swedes Iron, Blued..... 75%
Swedes Iron, Tinned or Cop'd..... 75%
American Iron Cut Tacks..... 75%
Swedes Ir. Uphol'srs Tacks, Blued, 75%
Swedes Iron Upholsterers' Tacks,
Tinned..... 77%
Gimp and Lace Tacks, Blued..... 75%
Gimp and Lace Tacks, Tinned..... 75%
Swedes Iron Basket or Trimmer
Tacks..... 70% to 10%
Miners' Tacks..... 77%
Bill-Posters' or Railroad Tacks..... 75%
Tinned..... 77%
Copper Tacks..... 40%
Copper Finish, & Trunk Nails..... 40%
Cigar Box Nails..... 50%
Zinc Glaziers' Points..... 40%
Picture-Frame Points..... 50%
Looking-Glass Tacks..... 50%
Brush Tacks..... 60%
Tin-Capped Trunk Nails..... 60%
Finishing Nails..... 70%
Trunk and Clout Nails, Black and
Tinned..... 75%
Common and Patent Brads..... 70%
Hungarian Nails..... 70%
Basket and Chair Nails..... 65%
Leathered Carpet Tacks..... 40%
Miscellaneous—
Double-Pointed, 120 count..... 35% to 10%
Wire Carpet Nails..... 60% to 10%
Plymouth Rock Steel Carpet Tacks..... 25%

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s
list.....60&105
Tapes, Measuring—
American.....40&4055
Spring.....405
Chesterman's, Regular list.....25&305

Thermometers—

Tin Case.....80&80&105

Thimble Skelins—See Skelins.**Ties, Bale—Steel**

Standard Wire, list.....60&10&55

**Tinners' Shears, &c.—See Shears,
Tinners', &c.**

Tinware—

Stamped, Japanned and Pieced, list
Jan. 20 1887.....70&10&70&10&55

**Tire Benders, Upsetters, &c.—
See Benders and Upsetters, Tire.**

Tools.**Coopers'—**

Bradley's.....305
Barton's.....30&30&55
L. & J. White.....30&55
Albertson Mfg. Co.....255
Beatty's.....305
Sandusky Tool Co.....30&30&55
Fhaves, Cincinnati Tool Co.....305

Lumber.

Ring Peavies, "Blue Line".....\$ dos 30.00
Ring Peavies, Common.....\$ dos 18.00
Steel Socket Peavies.....\$ dos 21.00
Mall. Iron Socket Peavies.....\$ dos 19.00
Cant Hooks, "Blue Line".....\$ dos 16.00
Cant Hooks, Common Finish.....\$ dos 14.00
Cant Hooks, Mall. Socket Clasp, "Blue
Line" Finish.....\$ dos 14.00
Cant Hooks, Mall. Socket Clasp, Com-
mon Finish.....\$ dos 14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish.....\$ dos 14.00
Cant Hooks, Clip Clasp, Common Fin-
ish.....\$ dos 12.00
Hand Spikes.....\$ dos 6 ft., \$15.00; 8 ft.,
\$20.00

Pike Poles, Pike & Hook, \$ dos, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, \$ dos, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, \$ dos, 12 ft.,
\$8.00; 14 ft., \$7.00; 16 ft., \$9.00; 18
ft., \$12.00; 20 ft., \$16.00.
Setting Poles, \$ dos, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00
Swamp Hooks.....\$ dos \$18.00

Saw.

Atkins' Perfection.....\$ dos \$12.00
Atkins' Excelsior.....\$ dos \$6.00
Atkins' Giant.....\$ dos \$4.00

**Tobacco Cutters—See Cutters, To-
bacco.**

**Transom Lifters—See Lifters,
Transom.**

Traps—**Game—**

Newhouse.....40&40&55
Oneida Pattern.....70&105
Game, Blake's Patent.....40&10&55

Mineral Oils.

Black, 20 gravity, 25 @ 30
cold test.....7 1/2 @ 8
Black, 20 gravity, 15 cold
test.....8 1/2 @ 9
Black, 20 gravity, summer.
6 1/2 @ 7
Cylinder light, altered.....15 @ 20

Animal and Vegetable Oils.
Linsed, City, raw, per gal. 55 @ 62
Linsed, City, boiled.....61 @ 65
Linsed, Western, raw.....50 @ 54
Lard, City, Extra Winter.....50 @ 51
Lard, City, Prime.....44 @ 48
Lard, City, No. 1.....40 @ 43
Lard, Western, prime.....48 @ 49
Cotton-seed, Crude, prime.....29 @ 30
Cotton-seed, Crude, off
grades.....22 @ 27
Cotton-seed, Summer Yel-
low, prime.....34 @ 36
Cotton-seed, Summer Yel-
low, off grades.....28 @ 32
Sperm, Crude.....73 @ 78
Sperm, Natural Spring.....73 @ 75
Sperm, Bleached Spring.....73 @ 75
Sperm, Natural Winter.....73 @ 75
Sperm, Bleached Winter.....73 @ 75
Whale, Crude.....54 @ 55
Whale, Natural Winter.....54 @ 55
Whale, Bleached Winter.....56 @ 57
Whale, Extra Bleached.....58 @ 59
Sea Elephant, Bleached
Winter.....63 @ 64
Menhaden, Crude, Sound.....27 @ 30
Menhaden, Crude, Southern.....29 @ 30
Menhaden, Light Pressed.....31 @ 32
Menhaden, Bleached W'ter.....31 @ 32
Menhaden, Extra Bleached.....34 @ 35
Tallow, City, prime.....44 @ 44
Tallow, Western, prime.....44 @ 44
Cocoonut, Ceylon.....6 1/2 @ 7
Cocoonut, Cochiti.....9 @ 9
Cod, Domestic.....38 @ 40
Cod, Foreign.....38 @ 40
Red Elaine.....35 @ 37
Red Saponified.....4 1/2 @ 4 1/2
Bank.....27 @ 28
Strait.....28 @ 29
Olive, Italian, blis.....72 1/2 @ 77 1/2
Neatsfoot, prime.....55 @ 55
Palm, prime, Lagos.....5 1/2 @ 6 1/2

Mineral Oils.

Black, 20 gravity, 25 @ 30
cold test.....7 1/2 @ 8
Black, 20 gravity, 15 cold
test.....8 1/2 @ 9
Black, 20 gravity, summer.
6 1/2 @ 7
Cylinder light, altered.....15 @ 20

Moose and Rat—
Moose Wood Choker, \$ dos holes, 11 @ 12 1/2
Moose, Round Wire.....\$ dos \$1.50, 105
Moose, Cage, Wire.....\$ dos \$2.50, 105
Moose, Catch-em-alive.....\$ dos \$2.50, 154
Moose, Bonanza.....\$ dos \$0.90 @ \$1.25
Moose, Delusion.....\$ gr \$10.00, 105
Ideal.....\$ gr \$10.00, 105
Cyclone.....\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps,
\$ dos., 905; in full cases, \$ dos.....754
Hotchkiss Imp. Rat Killer.....\$ gr \$15.50
Hotchkiss New Rat Killer.....\$ gr \$15.50
Schuyler's Rat Killer.....\$ gr \$15.00

Trimmers.

Butter and cheese.....255

Trimmers, Spoke.

Bonney's.....\$ dos \$10.00, 505
Stearns.....30&105
Ives, No. 1, \$15.00; No. 2, \$15.00, \$ dos.
Douglas.....\$ dos \$0.00, 205
Cincinnati.....355

Trowels.

Lothrop's Brick and Plastering.....20&10&55

Reed's Brick and Plastering.....155
Dianon's Brick and Plastering.....255
Pence's Plastering.....255
Clement & Maynard's.....305
Rose's Brick.....15&205
Brade's Brick.....255
No. 24, \$ and \$ 3 Balls.....254
Worral's Brick and Plastering.....305
Garden.....705

Trucks, Warehouse, &c.—

R. & L. Block Co.'s list, '82.....405

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. B.
No. 9, 1/2 and 3/4 Balls.....254
No. 12, 1/2 and 3/4 Balls.....254
No. 15, 1/2 and 3/4 Balls.....254
No. 18, 1/2 and 3/4 Balls.....254
No. 24, 1/2 and 3/4 Balls.....254
No. 36, 1/2 and 3/4 Balls.....254
No. 204, Matgrass, 1/2 and 3/4 Balls.....254
Chalk Line, Cotton, 1/2 and 3/4 Balls.....254
Mason Line, Linen, 1/2 and 3/4 Balls.....254
2-Ply Hemp, 1/2 and 3/4 Balls (Spring
Twine).....104
3-Ply Hemp, 1/2 and 3/4 Balls.....104
3-Ply Hemp, 1/2 and 3/4 Balls.....104
Cotton Wrapping, 5 Balls to 1.....154
2, 3, 4 and 5-Ply Jute, 1/2 and 3/4 Balls.....104
Wool.....6 1/2 @ 6 1/2
Paper.....13 @ 14
Cotton Mops, 6, 9, 12 and 15 to do. 154

Vices—

Solid Box.....50&10&50&10&55
Parallel—
Fisher & Norris Double Screw.....15&105
Stephens.....25&305
Parker.....30&305
Wilson's.....555
Howard's.....405
Bonney's.....40&105
Millers Falls.....40&40&105
Trenton.....40&50&40&105
Merrill's.....40&10&105
Sargent's.....40&105
Backus and Union.....405
Double Screw Leg.....15&105
Prentiss.....30&255
Simpson's Adjustable.....405
Moore's.....205
Massey Quick Action.....20 @ 25 1/2

Saw Vices.

Bonney's, Nos. 2 & 3, \$15.00.....40&105
Stearns.....33&405
Stearns' Silent Saw Vices.....33&405

Paints and Colors.

Barytes, Prime White.....\$ ton \$21.00 @ \$25.50
Barytes, Amer. floated.....20.00 @ 30.00
Barytes, Amer. No. 1.....19.00 @ 20.00
Barytes, Amer. No. 2.....15.00 @ 16.00
Barytes, Amer. No. 3.....11.00 @ 13.00
Blue, Celestial.....\$ 6 @ 8
Blue, Chinese.....50 @ 55
Blue, Prussian.....25 @ 40
Blue, Ultramarine.....8 @ 25
Brown, Spanish.....1/2 @ 1
Brown, Vandyke, Amer.....3 @ 3 1/2
Brown, Vandyke, English.....6 @ 8
Carmine, No. 40, in bulk, 3.10 @ ..
Carmine, No. 40, in boxes
or barrels.....3.20 @ ..
Carmine, No. 40, in ounce
bottles.....4.20 @ ..
Chalk, in bulk.....\$ ton, 2.50 @ 2.75
Chalk, in blis, \$ 100 B.....33 @ 40
China Clay, English.....\$ ton \$13.00 @ 15.00
Cobalt Oxide, prep'd.....2.90 @ ..
Cobalt Oxide, black.....lots 100 B \$ 3.60 @ ..
Cobalt Oxide, black.....less 100 B \$ 3.65 @ ..
Green, Paris, in bulk.....14 @ 14 1/2
Green, Paris, 170 @ 175 B.....14 1/2 @ 15
Green, Paris, small pack.....16 @ 21
Green, Chrome, ordinary.....8 @ 11
Green, Chrome, pure.....22 @ 25
Lead, Eng., R.E. white.....8 1/2 @ 10
Lead, Amn. White, dry or in oil:
Kegs, lots less than 1000 B.....\$ 7 1/2 @ 8
Kegs, lots 1000 B to 5 tons.....\$ 6 1/2 @ 7
Kegs, lots 5 tons to 12 tons.....\$ 6 @ 6 1/2
Kegs, lots 12 tons and over.....\$ 5 1/2 @ 6
Lead White in oil 35 @ tin
pails add to kee price.....\$ 3 1/2

Paints and Colors.

Lead, White, in oil, 12 1/2 @ tin
pails, add to kee price.....\$ 1
Lead, White, in oil, 1 to 5 B as-
sorted tins, add to kee price.....\$ 2 1/2
Lead, Red, bbls. and 1/2 blis.....6 1/2 @ 7 1/2
Lead, Red, kegs.....6 1/2 @ 7 1/2
Litharge, Eng.....6 1/2 @ 7 1/2
Litharge, bbls. and 1/2 blis.....6 1/2 @ 7
TERMS, &c.—Lead and Litharge.—On
lots of 1000 B or over, 60 days' time or
2 1/2 % discount for cash if paid within 15
days of date of invoice.

Sargent's.....60&105
Hopkins.....\$ dos \$17.50, 105
Reading.....0&105
Wentworth.....20&105
Miscellaneous.
Combination Hand Vices.....\$ gr \$42.00
Covell Hand Vices.....305
Bauer's Pipe Vices.....105
Cincinnati.....25&105
Enterprise Pipe Vices, each.....\$ 5.00
Massey Combination Pipe.....40 1/2

Wagon Boxes—See Boxes, Wagon.**Washer Cutters—See Cutters,
Washer.****Wagon Jacks—See Jacks, Wagon.****Ware, Hollow, Enameled, &c.**

Cast Iron, Hollow—
Stove Hollow-Ware.....60&105
Ground.....60&105
Unground.....60&105
White Enameled-Ware—
Mashin Kettles.....705
Boilers and Saucepans.....40&10&50&55
Tinned Boilers and S'pans.....40&10&50&55
Rustless Hollow-Ware.....50&50&55
Gray Enameled Ware.....505
Stove.....505
Mashin Kettles.....60&10&105
Boilers and Saucepans.....40&255
Enameled—
Agate and Granite Ware, list Jan. 1,
1889.....33&105
Ironclad Enameled Ware.....dis 33&105

Kettles.

Galvanized Tea-Kettles—

Inch.....6 7 8 9
Each.....55 60 65 75

Standard Fiber—

Wash-Basins, 10 1/2 in.....\$2.00 \$2.25
Wash-Basins, 12 in.....2.25 2.75
Keelers, 11 1/2 in.....4.00 4.50
Cuspidors.....4.00 4.50
Spittoons, "Daisy" 2 in.....4.00 4.50
Peck Measure.....4.00
Half-Peck Measure.....3.50
See also Pails.

Indurated Fiber—255

Spittoons, No. 2, \$ dos.....\$9.00
Basins, Ringed, \$ dos, No. 2, \$4.80;
No. 3.....\$4.20
Washbas, Nested, Nos. 0, 1, 2 and 3 (4
pieces), \$ nest.....\$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4
pieces), \$ nest.....\$3.70
Butter Bowls 15, 17 and 19-inch (3
pieces), \$ nest.....\$2.25
Liquid Measures, pt., qt., 2 qt. and fun-
nel (4 pieces), \$ set.....\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qt. (5
pieces), \$ set.....\$3.00
See also Pails.

Silver Plated, Hollow—

4 mo. or 5 % cash in 30 days.

Reed & Barton.....40&55
Meriden Britannia Co.....40&55
Simpson, Hall, Miller & Co.....40&55
Rogers & Brother.....40&55
Hartford Silver Plate Co.....40&55
William Rogers Mfg. Co.....40&55

Washers—

Size hole.....5-16 3/4 1/2 3/4 to 1 1/2
Washers.....5 5 5.50 8
In lots less than 200 B, \$ 2, add 1/4, 5-B
boxes 1/2 to list.

Wedges—

Iron.....\$ 3 1/2 @ 3 1/2
Steel.....\$ 3 1/2 @ 3 1/2

Weights, Sash—

Solid Eyes.....\$ ton \$18 @ \$19

**Well Buckets, Galvanized—See
Buckets, Well, Galvanized.****Wheels, Well.**

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.35

Wire and Wire Goods—**Iron—**

Market.
Br. & Ann'd, Nos. 0 to 18.....754
Cor'd, Nos. 0 to 18.....72 1/2
Galv., Nos. 0 to 18.....654
Tin'd, Tinned list Nos. 0 to 18.....654
Stone,
Br. & Ann'd, Nos. 16 to 18.....754
Bright and Ann'd, Nos. 19 to 26.....77 1/2
Br. & Ann'd, Nos. 27 to 36.....805
Tinned.....544
Tinned Broom Wire, 15 to 21, \$ B.....544
Galvanized Fence, Nos. 8 and 9.....67 1/2
Annealed Fence, Nos. 8 and 9.....77 1/2
Annealed Grape, Nos. 10 to 14.....77 1/2
Brass, list Jan. 18, 1884.....304
Copper, list Jan. 18, 1884.....304
Barb Fence.....See Trade Report
Annealed Wire on Spools.....554
Mallin's Steel and Tin'd on Spools.....554
Mallin's Brass and Cop. on Spools.....554
Tate's Spooled, Tinned and Annealed.....554
Tate's Spooled Cop. and Brass.....454
Cast Steel Wire.....505
Stub's Steel Wire.....\$ 6.00 to 2, 305
Steel Music Wire, 12 to 30.....70 1/2 @ 70 1/2
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—

Standard list.....85&105

Wire Cloth and Netting.

Painted Screen Cloth, good quality,
\$ 100 sq. ft., \$1.40

Galvanized Wire Netting.....70&10&754

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable.....405
Baxter's Adjustable "S".....40&505
Baxter's Diagonal.....40&10&505
Coe's Genuine.....50&55
Coe's "Mechanics".....50&10&55
Girard Standard.....65&105
Lamson & Sessions' Engineers.....60&105
Lamson & Sessions' Standard.....70&105
P. S. & W. Agricultural.....75&5 @ 75
Lamson & Sessions' Agric'l.....210
Bemis & Call's
Pat. Combination.....355
Merrick's Pattern.....355
Briggs' Pattern.....255
Cylinder or Gas Pipe.....40&55
No. 8 Pipe.....40&105
Aiken's Pocket (Bright).....\$ 6.00, 50&105
The Favorite Pocket.....\$ dos \$4.00, 405
Webster's Pat. Combination.....255
Boardman's.....20&105
Always Ready.....25&55
Simpson, Hall, Miller & Co.....505
Donohue's Engineer.....40&105
Acme, Bright.....50&25
Acme, Nickleod.....40&25
Hercules.....705
Walker's.....55&25
Diamond Steel.....55&25
Cincinnati Brace Wrenches.....35&105
Tate's Vise Wrench.....55&10&55

Wringers, Clothes—

List September 20, 1890, 2 1/2 % cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 19, 1880
85&85&104

PAINTS, OILS AND COLORS.—Wholesale Prices.**Animal and Vegetable Oils.**

Linsed, City, raw, per gal. 55 @ 62
Linsed, City, boiled.....61 @ 65
Linsed, Western, raw.....50 @ 54
Lard, City, Extra Winter.....50 @ 51
Lard, City, Prime.....44 @ 48
Lard, City, No. 1.....40 @ 43
Lard, Western, prime.....48 @ 49
Cotton-seed, Crude, prime.....29 @ 30
Cotton-seed, Crude, off
grades.....22 @ 27
Cotton-seed, Summer Yel-
low, prime.....34 @ 36
Cotton-seed, Summer Yel-
low, off grades.....28 @ 32
Sperm, Crude.....73 @ 78
Sperm, Natural Spring.....73 @ 75
Sperm, Bleached Spring.....73 @ 75
Sperm, Natural Winter.....73 @ 75
Sperm, Bleached Winter.....73 @ 75
Whale, Crude.....54 @ 55
Whale, Natural Winter.....54 @ 55
Whale, Bleached Winter.....56 @ 57
Whale, Extra Bleached.....58 @ 59
Sea Elephant, Bleached
Winter.....63 @ 64
Menhaden, Crude, Sound.....27 @ 30
Menhaden, Crude, Southern.....29 @ 30
Menhaden, Light Pressed.....31 @ 32
Menhaden, Bleached W'ter.....31 @ 32
Menhaden, Extra Bleached.....34 @ 35
Tallow, City, prime.....44 @ 44
Tallow, Western, prime.....44 @ 44
Cocoonut, Ceylon.....6 1/2 @ 7
Cocoonut, Cochiti.....9 @ 9
Cod, Domestic.....38 @ 40
Cod, Foreign.....38 @ 40
Red Elaine.....35 @ 37
Red Saponified.....4 1/2 @ 4 1/2
Bank.....27 @ 28
Strait.....28 @ 29
Olive, Italian, blis.....72 1/2 @ 77 1/2
Neatsfoot, prime.....55 @ 55
Palm, prime, Lagos.....5 1/2 @ 6 1/2

Mineral Oils.

Black, 20 gravity, 25 @ 30
cold test.....7 1/2 @ 8
Black, 20 gravity, 15 cold
test.....8 1/2 @ 9
Black, 20 gravity, summer.
6 1/2 @ 7
Cylinder light, altered.....15 @ 20

Cylinder, dark, altered.....14 @ 20
Cylinder, dard, s'm refined.....10 @ 18
Paraffine, 23 1/2 @ 24 gravity.....13 1/2 @ 14
Paraffine, 25 gravity.....12 1/2 @ 13
Paraffine, 28 gravity.....10 1/2 @ 11
Paraffine, red, 21 @ 22 gr'ty.....10 1/2 @ 11
Paraffine, red, 23 1/2 @ 23 gr'ty.....12 @ 14

Paints and Colors.

Barytes, Prime White.....\$ ton \$21.00 @ \$25.50
Barytes, Amer. floated.....20.00 @ 30.00
Barytes, Amer. No. 1.....19.00 @ 20.00
Barytes, Amer. No. 2.....15.00 @ 16.00
Barytes, Amer. No. 3.....11.00 @ 13.00
Blue, Celestial.....\$ 6 @ 8
Blue, Chinese.....50 @ 55
Blue, Prussian.....25 @ 40
Blue, Ultramarine.....8 @ 25
Brown, Spanish.....1/2 @ 1
Brown, Vandyke, Amer.....3 @ 3 1/2
Brown, Vandyke, English.....6 @ 8
Carmine, No. 40, in bulk, 3.10 @ ..
Carmine, No. 40, in boxes
or barrels.....3.20 @ ..
Carmine, No. 40, in ounce
bottles.....4.20 @ ..
Chalk, in bulk.....\$ ton, 2.50 @ 2.75
Chalk, in blis, \$ 100 B.....33 @ 40
China Clay, English.....\$ ton \$13.00 @ 15.00
Cobalt Oxide, prep'd.....2.90 @ ..
Cobalt Oxide, black.....lots 100 B \$ 3.60 @ ..
Cobalt Oxide, black.....less 100 B \$ 3.65 @ ..
Green, Paris, in bulk.....14 @ 14 1/2
Green, Paris, 170 @ 175 B.....14 1/2 @ 15
Green, Paris, small pack.....16 @ 21
Green, Chrome, ordinary.....8 @ 11
Green, Chrome, pure.....22 @ 25
Lead, Eng., R.E. white.....8 1/2 @ 10
Lead, Amn. White, dry or in oil:
Kegs, lots less than 1000 B.....\$ 7 1/2 @ 8
Kegs, lots 1000 B to 5 tons.....\$ 6 1/2 @ 7
Kegs, lots 5 tons to 12 tons.....\$ 6 @ 6 1/2
Kegs, lots 12 tons and over.....\$ 5 1/2 @ 6
Lead White in oil 35 @ tin
pails add to kee price.....\$ 3 1/2

Lead, White, in oil, 12 1/2 @ tin
pails, add to kee price.....\$ 1
Lead, White, in oil, 1 to 5 B as-
sorted tins, add to kee price.....\$ 2 1/2
Lead, Red, bbls. and 1/2 blis.....6 1/2 @ 7 1/2
Lead, Red, kegs.....6 1/2 @ 7 1/2
Litharge, Eng.....6 1/2 @ 7 1/2
Litharge, bbls. and 1/2 blis.....6 1/2 @ 7

TERMS, &c.—Lead and Litharge.—On

lots of 1000 B or over, 60 days' time or
2 1/2 % discount for cash if paid within 15
days of date of invoice.

Ocher, Rochelle.....1.35 @ 1 1/2
Ocher, French Washed.....1 1/2 @ 2
Ocher, German Washed.....1 1/2 @ 2
Ocher, American.....1 1/2 @ 1 1/2
Orange Mineral, English.....9 @ 9 1/2
Orange Mineral, French.....10 @ 10 1/2
Orange Mineral, German.....9 1/2 @ 10
Orange Mineral, American.....8 @ 8 1/2
Paris White, English Cliff-
stone.....1.00 @ 1.15
Paris White, American.....70 @ 75
Red, Indian, English.....5 1/2 @ 7
Red, Indian, American.....2 @ 1 1/2
Red, Turkey.....9 @ 14
Red, Tuscan.....9 @ 11
Red, Venetian, American.....\$ 100 B, 1.00 @ 1.25
Red, Venetian, English.....1.00 @ 1.50
Sienna, Italian, Burnt and
Powd'.....5 @ 6 1/2
Sienna, Ital., Burnt Lumps.....1 1/2 @ 3 1/2
Sienna, Ital., Raw Powd'.....5 @ 6 1/2
Sienna, Ital., Raw Lumps.....2 @ 3 1/2
Sienna, American, Raw.....1 1/2 @ 1 1/2
Sienna, American, Burnt
and Powdered.....1 1/2 @ 1 1/2
Talc, French.....14 @ 14 1/2
Talc, American.....90 @ 1.00
Terra Alba, F'ch, \$ 100 B.....90 @ 1.00
Terra Alba, English.....50 @ 60
Terra Alba, American No. 1.....70 @ 75
Terra Alba, American No. 2.....40 @ 60
Umber, Turkey, Bnt. and
Powd'.....3 1/2 @ 4
Umber, Lurkey Bnt. Ln
Umber, Turkey, Raw and
Powd'.....3 1/2 @ 4
Umber, Turkey, R'w Lmps.....2 1/2 @ 3 1/2
Umber, Turkey, Bnt. Amer.....1 1/2 @ 1 1/2
Umber, Turkey, R'w Amer.....1 1/2 @ 1 1/2
Yellow, Chrome.....10 @ 25
Vermilion, Americ. Lead.....11 1/2 @ 17

